

The Impact of Policy and COVID-19 Prevention Strategies in China: A Qualitative Study

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Research

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

DOI: <https://doi.org/10.21203/rs.3.rs-710681/v1>

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Abstract

Background: Ongoing infection-control strategies have played an important role in preventing the spread of COVID-19 and mitigating its effects. However, limited studies have explored the influence of these strategies from the perspective of COVID-19 patients.

This study aims to describe the impact of governmental COVID-19 policy and prevention strategies on COVID-19 patients in China.

Methods: Twenty-six people who had been treated for COVID-19 in a COVID-19-designated facility in Shanghai, China, were recruited using the purposive sampling method. These individuals participated in semi-structured interviews by phone from April to June 2020. A thematic content analysis approach was conducted. The consolidated criteria for reporting qualitative studies checklist was applied.

Results: Three categories of themes emerged from the thematic analysis. The first was "Consciously adhere to COVID-19-related infection-control strategies." Most of these patients followed the COVID-19 strategies throughout the stages of their illness. The second category was "Positive experiences of the COVID-19-related infection-control strategies." These patients shared their positive experiences of the governmental infection-control strategies to contain the virus; for example, they experienced a quick and adequate medical response, they were confident in the medical system, or they received help from community workers. The third category was "Negative experiences of the COVID-19-related infection-control strategies." These patients experienced psychological distress, stigma, privacy exposures, and inconveniences from the governmental strategies.

Conclusions: Our findings exemplify how patients with COVID-19 adhered to the infection-control strategies in China. 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.

Introduction

The novel coronavirus disease 2019 (COVID-19) pandemic has become a major global threat [1]. As of July 2020, many countries, such as the United States, India, and Brazil, continued to have increasing numbers of confirmed cases or remained at peak levels of cases [2]. Fortunately, China reached a period where not many new confirmed community-spread cases of COVID-19 occurred[3]. However, a number of waves of outbreaks came in several cities and metropolitan areas in 2020, but they were brought under control through testing, contact tracing, and quarantines[4]. As targeted medications were not yet available and vaccines were not widely distributed, the strict infection prevention and control strategies deployed by China played a pivotal role in controlling the COVID-19 outbreak in that country [5].

Background

The establishment and implementation of societal strategies and policies in China have been profoundly influenced by Confucian views ever since the philosopher lived[6]. “The ruler guides the subject” was one of the Three Cardinal Guides outlined by Confucianism as the hierarchy of responsibility for maintaining social order [6–7]. In contrast to Western countries, China has a centralized and unified administrative system and, thus, can robustly motivate the administrative execution of national policies by all levels of governmental departments in response to major public health emergencies [8].

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[9]. In addition, China required all healthcare providers to use personal protective equipment at all times[10], increased testing capacity, and accelerated reporting[11].

Studies have found that most of the control strategies implemented in China might have been effective in mitigating the COVID-19 epidemic [12–13]. 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 [12]. 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 3 times larger than it was [14]. 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[5]. 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[13] 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[12–15] or mathematical model predictions[13–16] ; 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, families, and communities should not be ignored [13]. Excessive use of infection-control strategies, such as mass quarantines, cause negative mental stress, such as fear, acute stress disorder, anxiety, and depression[17–18], as do excessive self-protective behaviors such as disinfecting clothes every day or every other day, overly frequent hand washing or sanitizing, hoarding of personal protective equipment (PPE), and arranging for others to handle personal or work responsibilities should one get sick[19] .

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[20]. 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, especially by those who have gone through the suspected, diagnosed, hospitalized, and recovery stages of the disease.

Methods

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 [21].

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 patients were contacted, of whom 26 were recruited after securing their oral informed consent (36% acceptance rate). After securing oral study consent, 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 [22]. All study participants received a small stipend for their participation.

Qualitative data collection

Two Chinese-speaking researchers (MD, registered nurses, female) 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 2 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?"

Qualitative data analysis

Data analysis occurred concurrently with data collection. The audio recordings were transcribed verbatim by nursing graduate students. To ensure confidentiality, we assigned an ID code for each participant and removed potential identifiable information from the transcription. 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[23]. 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 findings and to ensure that the findings were supported by the study data.

Results

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 ($SD= 7.73$). Twelve were male (46%) and 14 were female (54%). Eighty percent of patients had a bachelor's degree or higher. Regarding their place of residence, 69% of the patients lived in Shanghai, 15% lived in Hubei province, 8% lived in Zhejiang Province, and 4% lived in Fujian and Guangdong province, respectively. About 73% of the patients were living with family members.

Thematic results

Three main themes were discerned: "consciously adhere to the COVID-19-related infection-control strategies," "positive experiences of the COVID-19-related infection-control strategies," and "negative

experiences of the COVID-19-related infection-control strategies." A discussion of each of these themes follows.

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

Most 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: Most 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)

"During the trip back from Wuhan, I wore N95 masks and didn't take any public transportation. I just called a taxi, and the driver was also wearing a mask, so I went straight home. After I got home, I didn't go out for 14 days." (32-year-old, female, single)

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 policy, 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 first and third 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 healthcare 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, most 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[24–25].

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

Medical response: 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 most 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."

Confidence in the medical system and infection-control strategies: Most participants said that the medical system and infection control strategies in Shanghai were comprehensive and that healthcare procedures were standard. Thus, they really 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 (32-year-old, female, married) said, "I would like to thank the public health center for treating me. The doctor told us that every patient's treatment management was individualized and had been discussed by the most authoritative experts in the facility. That made me feel very safe."

Another 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." (30-year-old, female, married)

Getting help from the community: Participants also said that community workers provided lots of 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: Most 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 one meter, 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)

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)

"Every time I asked about my condition, the doctor just said that you are fine, and no big problem. However, I did not have a clear understanding of what is 'fine.' Generally, the doctors didn't communicate with us during the doctor's rounds. Also, maybe it was difficult to wear the PPE; I didn't see my primary doctor that often." (34-year-old, male, 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. "I didn't know that my personal information, like my diagnosed information, my children's names and grades were posted on the internet. My wife told me that due to the school reporting policy, she was required to disclose my condition to my child's school. But my condition was disclosed to all the parents in the school by one teacher. I was so angry." (41-year-old, male, married)

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 28-year-old single male said, "Now, the government has announced that everyone should go back to work. But my office manager told me that I should stay home until further notice. My company administrator asked me to go to a designated hospital for another checkup. Then, after the administrator got the tests, if everything was fine, I could go back to work. My colleagues have been going back to work but I am still staying home."

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.”

Discussion

During pandemics, the efficacy of health policies is an important part of protecting the population[13], especially from the patient-centered point of view[26]. 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 [20 – 17], 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[20]. 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[6]. In other words, the participants' compliance with the COVID-19-related infection-control strategies was in accordance with their place in the social and familial hierarchy to facilitate the orderly and smooth functioning of society [6– 7].

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[27]. Health literacy is as important for the prevention of communicable diseases as it is for non-communicable diseases [28]. 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[11– 28].

Our findings also found some negative reactions to the infection-control strategies, which should not be ignored. Consistent with previous studies on community residents[17], 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[26]. Also, mental health interventions would be helpful for those suffering psychological stress [29]. 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[30]. This stigma is associated with social panic and misconceptions about COVID-19 [9]; 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 [9].

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 [20]. 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[31] (Office of the Central Cyberspace Affairs Commission of China, 2020).

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, we recruited study participants from one designated hospital in Shanghai, so results might not be generalizable to all COVID-19-infected patients in China. Although Shanghai has one of the best public health systems in the country, it is also at the highest risk of potential COVID-19 eruptions, as many migrant workers reside in this 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.

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. The positive experiences of patients included the quick and adequate medical response, their confidence in the medical system and strategies, the help provided by community workers, and their enhanced health literacy. 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.

Relevance to clinical practice

The COVID-19 pandemic should be controllable as long as the right measures are implemented[32]. The joint efforts of the government and the people should all contribute to this endeavor[11]. 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[17]. 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[33]. Thus, when the design and targeting of effective interventions for preventing and mitigating COVID-19 are considered, 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 and cognitive therapy are potential management tools that could be adapted. Furthermore, 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.

Declarations

Ethics approval and consent to participate

Before the survey was conducted, all participants provided written informed consent. This research was approved by the institutional review boards of UCLA (IRB#20-000832) and Shanghai Public Health Clinical Center (YZ-2020-S037-01). All methods were performed in accordance with the relevant guidelines and regulations.

Consent for publication

Not applicable.

Availability of data and material

The original data are available on request to the corresponding author after the manuscript is published. We also plan to provide the original data to public repositories.

Competing interests

The authors declare that they have no competing interests.

Funding

This publication is a result, in part, from research supported by Fudan University Science Establishment (IDF162005), Novel coronavirus "2019-NCOV" research project (No. 2020YJKY01), UCLA CTSI/SON Intramural fund March 2020, FIC (R21TW011277) and NIMH (No. P30MH058107; R25MH087217).

Authors' contributions

Wei-ti Chen: Conceptualization, Methodology, Funding acquisition, Writing- Reviewing and Editing.

Lin Zhang: Resources, Funding acquisition.

Hongzhou Lu: Resources, Supervision.

Fei Fei Huang: Interview, Data analysis, Writing- Original draft preparation.

Wenxiu Sun: Software, Validation, Interview.

Acknowledgements

We gratefully acknowledge all the study participants, without them, it is not possible to complete these projects.

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