

COVID-19 experience in mainland China: Nursing lessons for the United States of America

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Abstract

COVID-19 emerged in Wuhan, China, and began its worldwide journey. As the severity of the virus became known, the Chinese National Government mobilized resources, and their centralized management was critical to the containment of the epidemic. Health-care agencies and providers were overwhelmed with patients, many of whom were critically ill and died. Nurses adapted to the work using personal protective equipment, but its initial scarcity contributed to stressful working conditions. Nurses in the United States can take several lessons from the experiences of their Chinese nurse colleagues, including the benefit of centralized management of the epidemic, the need for specialized treatment facilities, and the importance of a national stockpile of critical equipment and supplies. A fully funded United States Department of Health and Human Services Office of Pandemics and Emerging Threats is necessary. A nursing department within the office and a national mobilization plan to send nurses to support local efforts during a pandemic or other threat are likewise essential. Continuous training for nurses, especially caring for patients with infectious diseases in intensive care units, stress management, and how to comfort the dying, are also useful lessons.

KEYWORDS

China, COVID-19, lessons learned, nursing, pandemic

1 | BACKGROUND

In late December 2019, unexplained and severe pneumonia emerged in a group of patients in Wuhan, China. The route of transmission was unknown, and public health agencies were uncertain of the infection's etiology. Researchers at large virology laboratories worked tirelessly to identify the novel virus and government officials worked to define the epidemic's scope.

1.1 | First 30 days of the epidemic

On December 30, 2019, the Wuhan health commission notified hospitals of pneumonia cases of unclear causes and requested all patients with symptoms to report their cases. A total of 27 cases were previously confirmed on December 27. The market that was thought of as the origin

of the transmission was closed. The China office of the World Health Organization (WHO) of the unknown illness was notified.¹

Inevitable confusion arose between the public health threat and the perceptions of the virus among governmental officials. By January 2, 2020, the genetic mapping of the coronavirus virus was completed. The human-to-human transmission was confirmed on January 20. The People's Daily reported the coronavirus's existence to the world on January 21.¹

On January 20, an infectious disease caused by a newly discovered coronavirus² was classified as a Class B infectious disease, which required a Chinese border health quarantine. The assessment included a temperature check and statements of health status. Quarantine for those with COVID-19 was imposed at transport depots in compliance with the law.³

The response to law and order from the Central Party and Legal Affairs Commission on social media informed the public to remember

the painful lesson of SARS (severe acute respiratory syndrome, a viral respiratory illness caused by a coronavirus)⁴ and promptly report any suspected COVID-19 cases. Wuhan and three other cities were placed on “lockdown” on January 23. By January 24, the “lockdown” was extended and covered 36 million people. An expedited building campaign in Wuhan expanded the number of hospital beds to 1000. Reserve hospital beds were also provided to support patient needs.³

The following information aims to understand the Chinese government's public health and nursing responses to the coronavirus epidemic.

1.2 | Centralized approach to COVID-19 management

The Central Committee of the Communist Party and the State Council of China quickly initiated the National Emergency Response. A Disease Response and Joint Prevention and Control Group State council structure were likewise organized. The top government priority was to prevent, control, and deploy resources to treat those with COVID-19 and prevent its spread. The Central Epidemic Response team led by Minister Li Keqiang went to Wuhan to audit and coordinated the public health departments' work to prevent and control infectious diseases.^{3,5}

Anyone exposed to or infected with COVID-19 was quarantined and maintained under close medical observation. Additional steps taken included extending the Spring Festival holiday restriction, traffic restrictions, and transportation capacity management to reduce people's movement. All mass gathering events were canceled. Information on the epidemic and prevention and control mechanisms were widely published to keep the public informed.³

The National Health Ministry quickly mobilized a response to support Wuhan's public health and medical facilities. Hospitals that specialized in infection control were provided leadership support in conjunction with the Ministry of Health officials to create protocols and other specialized procedures. These measures were all designed to provide medical and nursing care and prevent infection spread, particularly among health-care workers.

Meanwhile, the National Health Ministry organized a national response to send health-care providers, with nurses as the largest number, to Wuhan. As of March 1, over 38,000 nurses had been sent to Hubei Province from all over China.⁶ The nurses were mostly 40 years old and younger, with the highest percentage under age 30. The Federal government and local officials collaborated regarding transportation, housing, and payroll for the health-care providers. All provinces in China helped Wuhan and priority areas in Hubei Province.³

Initially, a significant shortage occurred for personal protective equipment (PPE). In addition, the existing nursing staff was overwhelmed by the number of patients, and the lack of PPE limited the number of nurses available to care for patients.⁷

As further information became known about the disease, the need for a comprehensive PPE protocol quickly emerged. The PPE

supply was limited, given the overwhelming demand, but with the National Government's leadership, domestic production of PPE was placed on “fast track.” The centralized coordination and direction to state-owned factories allowed rapid response to ensure adequate PPE supplies and respirators. In a relatively short period, supplies and equipment became more available in Wuhan and throughout China.³

Standardized best practices were created and shared with health-care providers. One early adoption measure was to use the WHO recommendations on donning and doffing PPE. Standardized teaching plans and training aids were shared with health-care workers. Videos on how to properly use PPE were also developed.^{8,9}

The use of face masks was mandated for all citizens, with fines and other penalties imposed on those not wearing masks. Travel was restricted to help prevent the virus spread. Temperatures were monitored, and a symptom checklist was completed for health-care workers and others who had to enter public facilities. Contact tracing was implemented to help confine the virus.¹⁰

China's COVID-19 testing capability was able to satisfy domestic demand completely. High accuracy results were produced within 30 min using nucleic acid testing procedures. According to Bao Xianhua, an official from the Chinese Ministry of Science and Technology, China's testing capacity had successfully met the demand of 10 million people in Wuhan and Hunan Province of Central China, and more than 20 million in Beijing. Xianhua stated that “everyone who wants” and “needs to be tested” can undergo checking.¹¹

Any individual testing positive for COVID-19 was subjected to mandatory reporting. The National Health Commission of the People's Republic of China (PRC) provided oversight and coordination of all epidemiological activities. The Federal Government also sent epidemiologists to assist in isolating the virus source and to support the contact tracing and follow up. Technologies such as big data and artificial intelligence were introduced to reinforce contact tracing and management.³

1.3 | Initial triage response

In the early stages of the rampant virus spread, patients sought medical care in clinics and emergency rooms. The initial patient screening included a temperature check, and those with elevated temperatures were transferred to the fever clinic for examination. At this point, additional diagnostic assessments included a history and physical exam, various laboratory assessments, and a computed tomography scan. Patients suspected of having COVID-19 received a nucleic acid test for the virus. Patients with negative results were admitted to an isolation unit and then retested within 24 h. Those found positive with COVID-19 during a second test were transported to designated hospitals for additional treatment.

Numerous nurses were infected with COVID-19 before the highly contagious nature of the virus (SARS-Cov-2) could be identified. Most of the nurses' exposure occurred primarily before the clinics, emergency rooms, and hospitals adopted a level-3 PPE.¹²

Given the tremendous demand for hospital care, health-care facilities were initially challenged to provide care. All available hospital beds were quickly filled. Numerous community-based hospitals did not have sufficient dedicated infection control rooms and lacked the necessary PPE.¹²

1.4 | Nursing experience

Chinese nurses accounted for ~68% of the total medical workforce who cared for COVID-19 patients.⁶ To supplement the existing number of nurses in Wuhan, the National Government requested volunteers to travel to Hubei Province. Additional nurses also supported the local nursing staff using the resources within the National Health Ministry.

As expected during the initial phases of the epidemic, health-care facilities and their staff were overwhelmed with patients. As stated earlier, the limited availability of PPE also influenced the number of nurses who could use protective equipment to care for patients. As a result, the nurses with PPE worked 6-h shifts. While on duty, they could not access food and water, which removed the need for restroom breaks that required donning and doffing of PPE. These actions, in part, ensured that the nurses caring for COVID-19 patients had adequate PPE.^{13,14} The strict adherence to wearing PPE was a significant contributor to preventing contamination and infection of nurses with COVID-19.¹² Used was a buddy system when the nurses were donning and doffing PPE to ensure no protocol breach. When performing endotracheal innovations, the physicians and assisting nurses were required to wear positive-pressure headgear. Staff was encouraged to maintain a minimum of 6 ft from each other whenever possible. As a result, no standard one-on-one shift reports with incoming nurses were necessary.¹⁴

After their shifts, nurses returned to their hotels, changed clothes, bathed, and ate meals. Contact with family and co-workers during and after their shifts was not allowed to prevent infection spread. The nurses who lived in the Hubei Province could go home and maintain isolation from their families or use the government's hotel rooms.

Nurses were in close contact with COVID-19 patients and spent considerable time providing intensive care. The nurses regularly assessed their patients and monitored airways, tubes, medications, physical therapy, and positioning to reduce complications. For patients who were unable to care for themselves, nurses assisted with daily living activities. These activities included providing food and fluids as necessary, assisting with toileting, and providing oral hygiene and skincare. Patients with high acuity, particularly those on a ventilator, required nurses to be busy all during their shift. Little or no time was available to rest.¹⁴

The fear of virus contamination was highly stressful. Even when taking every precaution with the PPE, concerns about becoming infected were always present. Several nurses even developed depressive symptoms.¹⁵ Wearing the PPE for long periods was both physically and emotionally draining, and fatigue was overwhelming.^{14,16}

The nursing experience in the United States has been somewhat similar. The psychological and emotional stress experienced by Chinese nurses is also prevalent in the United States.¹⁷ There is an urgent need to address mental health well-being, particularly nurses. Anticipated is a high rate of posttraumatic stress disorder (PTSD) and posttraumatic stress symptoms (PTSS) among health care workers in both the United States and PRC. For those professionals involved in caring for COVID-19 patients, interventions to improve resilience and risk of adverse mental health conditions are important.¹⁸ The demand for the already limited staff to care for COVID-19 patients created much stress. The countless hours on duty providing nursing care took mental and physical tolls on several nurses. Frequent and unexpected deaths, especially of the elderly who could suddenly develop respiratory complications and die, all contributed to the emotional toll among nurses.¹³ Nurses died from cardiac arrest due to exhaustion.¹⁴

Given the need for isolation after completing their shifts, nurses mainly had a limited support system, thus creating additional stress. Smartphone and tablet technologies via video chats allowed the nurses to have individual social contact without any physical presence. The arrival of additional nursing staff and adequate PPE supply improved nurses' working environment.¹⁹

2 | IMPLICATIONS

2.1 | Centralizing management of epidemic/pandemics efforts

The US lacks central control of all pandemic responses, for which the Office of Pandemics and Emerging Threats in the Department of Health and Human Services²⁰ should be the logical lead agency. A command post of national coordination with full line authority, including management of all federal funding, should be accountable for the national response. Coordinators should work with state and local governments, but such collaboration was missing. From a nursing perspective, the coordination should include working with the US Division of Nursing in the Health and Human Services and the US Public Health Corp nursing division. The primary purpose would be to coordinate all civilian nursing personnel deployments across the nation. Working from a national nursing workforce strategic plan, these federal agencies would ensure a trained cadre of nurses ready for deployment to areas of urgent need. In PRC, the National government provides centralized control.^{21,22}

The plan could also include evidence-based practice protocol, including the donning and doffing of PPE, practice standards, stress management, emotional support to the dying, best practices in using unlicensed assistive personnel, and providing for adequate rest. State and local agencies could have certain flexibility with implementation guidelines based on local needs. The National Government Ministry of Health in PRC provides the evidenced-based protocols that health-care providers follow. Thus using a standardized treatment plan eliminates inconsistency in treatment responses.^{23,24}

2.2 | Dedicated treatment facilities for infectious disease patients

In China, the use of dedicated hospitals specific for infectious diseases for the most acute and highly infectious patients was considered an essential contributor to their success in protecting health-care workers. These dedicated hospitals also ensured that patients received state-of-the-art medical and nursing care. By comparison, the United States used a model where all acute care facilities became responsible for hospitalized COVID-19 patients.

Changing this paradigm for the future would mean creating, at the national level, a system that identified hospitals to manage infectious diseases in times of national emergency. Federal funding would be necessary to prepare these facilities to have cross purposes. One nursing implication would be an ongoing requirement to ensure competent staff in caring for infectious disease patients, focusing on PPE's proper use. A second focus would be on managing critically ill patients in intensive care units (ICU). Other required training areas included managing patients on respirators, stress management, and providing comfort for the dying. It appears in the PRC similar issues with staff training occurred. However, given the National government's centralized management, there was uniform training for nurses in using PPE and care for the COVID patients properly. In the United States, such consistency in training is lacking. While the Centers for Disease Control publishes guidelines, there are no mandates. Each treatment facility and team members determine their local protocols.

2.3 | A national stockpile of PPE, respirators, antiseptics, and medications

China had a national stockpile and found that the overwhelming demand quickly affected supply availability. However, through a central approach, medical-related items needed to care for COVID-19 patients were quickly mobilized. Within a relatively short period, appropriate supplies, equipment, and medications were made available by the National Health Commission of the PRC.⁶ The US response was primarily dependent on limited federal support. There was no urgency to enact the Defense Production Act. As a result, each state and their health care facilities were competing for PPE, medications, ventilators to care for their COVID patients. The Act was finally enacted on August 20, 2020, a full 8 months after the detection of COVID-19.²⁵

Given the COVID-19 outbreak in China and Italy, most treatment facilities had adequate notice to begin planning. However, the US Office of Pandemics and Emerging Threats was not adequately funded.²⁰ Thus, the limited staff was available to provide the needed assistance. This office needs immediate and full funding, including a nursing division, to facilitate planning for nursing-related activities. The nursing division could also ensure operational staff deployment plans, a national stockpile of supplies and equipment, and nationwide distribution centers. Additionally, the nursing division could manage and ensure continuous competency training.

2.4 | Conclusions

The COVID-19 response in China was initially slow; however, a coordinated response spearheaded by the Federal Government and other agencies was critical to contain COVID-19. The initial shortages of PPE and health-care professionals, especially nurses, were challenging. The physical demands of wearing PPE and providing nursing care to most ICU patients were, at times, overwhelming. Also, frequent and sudden patient deaths increased the stress among nurses. Lessons learned from the worldwide pandemic include the need for preparation for the infectious epidemic with centralized national control of efforts, wherein nurses' role is critical. A coordinated national effort was necessary to prepare and manage pandemics and emerging health threats. The lessons learned from China could serve as a guide as the world prepares for the next wave of COVID-19.

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