Original Article

Strategies Used for Management of Patients with COVID-19: A Comparative Study of Iranian and Chinese Nurses' Experiences

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Abstract

Background: Medical infrastructures, application of control strategies, and proper implementation of logistic policies are vital for successful management of an epidemic in a country, but all of them are under the influence of the health and management policies of countries. Thus, this study aimed to compare the strategies used by Iranian and Chinese nurses for management of patients with COVID-19. **Materials and Methods:** This study was conducted based on the conventional content analysis method of Graneheim and Lundman approach. Participants were recruited by purposeful sampling among the nurses working in the COVID-19 wards of Shariati Hospital in Tehran, Iran, and Haikou Hospital in Hainan, China. Data were collected by conducting semistructured interviews from August 2020 to February 2021. Then, the differences in used strategies by the nurses in the two countries were investigated using the data were analyzed using MAXQDA-10, qualitative data analysis software, and descriptive analysis technique. **Results:** In-depth interviews were carried out with nine Chinese and ten Iranian nurses. With "Managers as the key element to overcome the crisis" as the main category, six categories and 22 subcategories were excluded from the Iranian interviews. With "Action to control crisis" as the main category, eight categories and 19 subcategories were excluded from the Chinese interviews. **Conclusions:** Nursing managers in China focused on the process of training nurses to take care of patients with COVID-19 and reducing the transmission of infection among health care workers. However, nursing managers in Iran focused on compensating the shortage of nurses, shortening the duration of patients' hospitalization, daily monitoring of nurses' performance, and ventilator settings of patients.

Keywords: *COVID19, disease management, nursing care, patient care management*

Introduction

Due to the spread of COVID-19, the World Health Organization (WHO) used the word pandemic for it on March 11, 2020[1] and it was considered a health crisis. Crisis preparedness is critical for its management in all organizations.[2] The first cases of COVID-19 were detected in Wuhan, Hubei province in China, in December 2019[3] and in Iran on February 19, 2020. The first case was detected in two people residing in Qom.[4] As of April 20, 2023, 145,571 and 5272 cases were reported dead in Iran and China, respectively.[5]

During a pandemic crisis, leaders are called on to perform tasks such as preparation, planning, communication, and collaboration based on their content knowledge expertise.[6] Leaders who had successfully handled crises in the past found themselves repeatedly in uncharted territories when called on to lead during COVID-19 crisis.[7] As a result, the leadership and policy failures of COVID-19 are expected to add $125 to $200 billion in incremental costs to annual health care expenditures in the United States alone.[8] The current dynamic and global nature of the pandemic, structural chaos, media attention, and misinformation endemic to the crisis calls for a special set of leadership competencies to rapidly evolve pandemic response strategies to prevent, mitigate, and recover from the crisis and return to normalcy.[9,10]

China received much attention as the first country where cases of COVID-19 were reported. At the beginning of the pandemic, management of COVID-19 in China seemed difficult due to its large population. On the other hand, the significant differences in terms of morbidity and mortality rate[5] between Iran and China can indicate a difference in the strategies used to manage this crisis.

Different health and treatment systems, previous experience of encountering

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contagious diseases, people's collaboration in following social distance protocols, medical facilities, and financial resources can be reasons for using different management strategies and achieving different levels of success in the management of the COVID-19 crisis in China and Iran. The mentioned management strategies can finally be implemented by nurses who are in direct contact with patients suffering from COVID-19 for long hour.[11] Therefore, nurses are considered as the key informants who are well familiar with the strengths and weaknesses of management strategies used for caring COVID-19 patients. It is not possible to extract the experience of Iranian and Chinese nurses from the management strategies they used in managing COVID-19 except through qualitative research and in-depth face-to-face interviews. History of these pandemics is important because history repeats itself, and with each pandemic, knowledge was gained to improve health care. Therefore, it is imperative that research is conducted to determine evidence-based interventions to assist nurses caring for patients with COVID-19.[12] Hence, this study aimed to compare the experiences of Iranian and Chinese nurses in managing COVID-19 patients.

Materials and Methods

This study is a part of a large international project started at late 2020. A qualitative method was used to conduct this study in China and Iran. In order to explore and compare management strategies used by Iranian and Chinese nurses during caring patients with COVID-19, the conventional content analysis approach of the Graneheim and Lundman method was used.[13] In this descriptive qualitative study, participants were selected among nurses working in COVID-19 wards, head-nurses, supervisors, or matrons via the purposeful sampling method from Shariati Hospital in Tehran, Iran, and Haikou Hospital in Hainan, China. The inclusion criteria of participants included willingness to participate in the study and history of providing clinical care to patients with COVID-19 for at least 1 month.

Sampling was carried out based on constant comparative analysis, results of analysis, and maximum variation. Considering the fact that the interviewers were working as nurses in China and Iran in the same research environment, the title and purpose of the study were explained to the nurses at the beginning of the shift before they entered the COVID-19 wards. If they met the inclusion criteria, then they were included in the study based on purposive sampling. Approximately, three nurses in Iran and two nurses in China declined to take part in the study due to long shifts' durations in China, fatigue, and difficulty of tolerating low-quality personal protective equipment in Iran. Interviews continued until data saturation was reached. When categories and subcategories were completed and no new category was obtained, data saturation occurred and interviews were discontinued. Nine Chinese and ten Iranian nurses participated in the study.

Semistructured interviews and interview guides were used for data collection. Face-to-face in-depth interviews were done by a nurse in Iran and another expert nurse in China in the nurses' rest room of the COVID-19 wards. These interviewers had the experience of working in COVID-19 wards. A general question was used for the beginning of interviews: "What kind of strategies did you use for caring and managing patients with COVID-19?" or "What was the specific work that the managers (nurses) of hospitals undertook in response to COVID-19?", followed by probing questions in order to obtain more information [Table 1].

After setting the time and location of interviews based on the participants' preferences, interviews were recorded using a digital device with their permissions. Researchers attempted to spend time with participants before the interviews so that they would feel comfortable with the researcher. The interview time was between 45 and 90 min.

MAXQDA 10 was used for data management. The interviews were conducted in English. Each of the interviews was recorded and transcribed verbatim. Then, the data were broken down into meaningful units and labeled with conceptual names (code). After specifying open codes, the codes were grouped according to similarity and differences into categories. Each subcategory was grouped with similar meanings and considered as a category.[13] Then, categories and subcategories which were excluded from interviews with Iranian and Chinese nurses were compared. Their similarities and differences were extracted.

The criteria suggested by Guba and Lincoln to evaluate the credibility of the data were applied in this study.[14] The prolonged engagement with the participants during the interview period and member check helped to establish credibility. Moreover, analytic categories, interpretations, and conclusions were tested using member checks. Inquiry audits were used to establish dependability. Detailed descriptions of contexts and participants were used for transferability. Triangulation was used to establish confirmability.

Ethical considerations

The study protocol was approved by Tehran University of Medical Sciences (Ethical code = IR.TUMS.FNM.

Table 1: General questions which were asked of participants during interviews

No.	Queations
1	What kinds of strategies were used for caring and managing of patients with COVID-19?
2	What was the specific work that the managers (nurses) of hospital undertook in response to COVID-19?
3	Have you encountered any difficulties or challenges in managing human resources?
4	Did you have a training program for nursing staff and how was it undertaken?
5	What evidence did you refer to make the emergency plans?
6	Tell me the story of one day of your experience in COVID-19 ward or management ward.

REC.1399.132) and Medical university of Hainan (Ethical code = HYLL-2020-031). All ethical considerations such as getting written consent, maintaining data confidentiality at all stages, the possibility of excluding from the study at any stage, and optional participation in the study were observed.

Results

Generally, ten Iranian and nine Chinese nurses with different categories in terms of organizational position, age, gender, and work experience were interviewed. The Chinese nurses' age ranged from 27 to 50, and Iranian nurses were 25 to 54. Chinese nurses had 25 days to 12 months of work experience of caring patients with COVID-19, but Iranian nurses had 1–11 months [Table 2].

The analysis of the data obtained from the interviews of Chinese nurses led to the extraction of the main category "Action to control the crisis", and on the whole, eight categories and 19 main subcategories were extracted from the data [Table 3].

The analysis of the data obtained from the interviews of Iranian nurses led to the extraction of the main category "Managers as agent of overcoming the crisis", and on the whole, six categories and 22 subcategories were extracted from the data [Table 4].

The differences between categories extracted from interviews with Iranian and Chinese nurses included the following:

1. In the interview with Chinese nurses, they mentioned the rooms with negative pressure, which led to nausea and vomiting in the nurses, but these rooms did not exist in Iran.
2. Another major difference was the prominent role of the use of smart phone equipment by Chinese nurses, which played a significant role in managing the pandemic. The Chinese had placed a smart phone in the ward to facilitate communication between nurses and doctors, the purpose of which was to control infection. In addition, virtual groups consisting of nurses and physicians were formed. As soon as a problem occurred in the ward, the nurse would raise it in the group and would receive a suitable answer. On the other hand, the results of the tests were not printed on paper in China, which prevented the spread of the virus. Hospitalized patients in the same ward were added by the nurse in a group to receive emotional support from each other. Chinese had health codes, which were used to screen and identify suspicious people.
3. Chinese managers gave more importance to the training of nurses before entering quarantine wards, and they were trained in simulated wards before entering the quarantine ward. Donning and doffing Personal Protective Equipment (PPE), working with equipment, and hospital infection control skills were taught. Then, the nurses were interviewed through online or in person, and if they got a passing score, they would be allowed to enter the quarantine ward. During working in the quarantine ward, they received the necessary training virtually. But Iranian nurses received in-service training after entering the ward.
4. Limiting the number of nurses entering the quarantine ward, reducing the length of shifts from 8 h to 6 h, controlling the correctness of donning and doffing PPE

Table 2: Demographic information of Iranian and Chinese participants

Variable	Status	Chinese participants		Iraninan participants	
		Frequent	Percent	Frequent	Percent
Age	20-25	1	11.1	1	10
	26-30	2	22.2	4	40
	31-36	2	22.2	3	30
	37-45	3	33.3	1	10
	46 and more	1	11.1	1	10
Sex	male	3	33.4	0	0
	female	6	66.6	10	100
Marital status	single	3	33.4	3	30
	married	6	66.6	7	70
Education	Associate degree	1	11.1	0	0
	Bachelor and above	8	88.9	10	100
Shift work	morning	3	33.4	2	20
	night	1	11.1	0	0
	morning and night	5	55.5	8	80
Second job	yes	2	22.2	4	40
	no	7	77.8	6	60
History of nursing errors	yes	5	55.5	6	60
	no	4	44.5	4	40
Job position	Clinical nurse	138	80.7	7	70
	Nursing manager	33	19.3	3	30

Table 3: Category and subcategory extracted from the interviews of Chinese nurses

Main Category	Category	Subcategory	Exemplary code
Action to Control Crisis	1- Challenges of COVID-19 epidemic	1-1 Human resources' challenges	"Nurses were low competent and they need to be trained"
		1-2 Medical equipment challenges	"Inappropriate size of PPE and using plastic bags instead of shoe cover cause infection."
		1-3 Patients' challenges	"Elderly Chinese patients were Multilingualism."
		1-4 Hospitals' challenges	"Hospital were broken down due to large number of patients."
	2-Continuous online training of nurses	2-1 Before the nurses' entrance to quarantine wards	"Qualified nurses to work in quarantine wards were chosen by online training, taking interview and examination video."
		2-2 In-service training	"New data were trained through Wechat groups."
	3-Psychological support	3-1 More humanistic care of patients	"Nurses helped patients to overwhelm their fear by spending long time to talk and chat."
		3-2 Psychological support of nurses	" Head nurses monitored the diet, sleep and psychological dynamics of nurses."
	4- Holding hope and hopelessness	4-1 Impressed by medical staff	"Rescuing lots of sever COVID-19 pateints was like fighting in the battlefield."
		4-2 Impressed by patients	"Patients lost their hope when a member of family was died."
	5- Burnout of frontline nurses	5-1 Physical workload	"Nurse were Faint and lying down on the ground due to fatigue."
		5-2 Burden of mental distress	"each nurse were Living in a single room alone."
	6- China's successful control of COVID-19	6-1 Using guideline to diagnosis and perusing confirmed cases	"After a while an updated diagnosis and treatment guideline were used."
		6-2 Overcoming shortage of PPE and equipment	"PPE were manufacturing in hospital ."
		6-3 Sending qualified nurses to help other provinces	"specialist ICU nurses were send to other provinces for help."
		6-4 Cooperative manner of all wards of hospital	"Nurses had extra shifts with no complaint."
		6-5 Good performance of people	"Almost all Chinese were vaccinated in a short time."
		6-6 Good performance of administers	"Weekly video conference with head nurses to solve the problems."
		6-7 Previous experience of communicable diseases pandemic	"previous experience of nurses from SARS lead to not fear too much of COVID-19."
	7- Protecting medical staff from infection		
	8- Application of smart phone technology		"Nurses and doctors were connected and learnt from each other thorough Wechat."

PPE=Personal Protective Equipment, ICU=Intensive Care Unit

by the head nurses, and forcing nurses to live in separate rooms in the hotel were among the measures of the Chinese managers to limit the spread of the virus. Iranian nurses mentioned the possibility of staying in a hotel.

5. In China, triage nurses followed and examined people who had close contact with the sick person.
6. Iranian nurses mentioned the improvement of working relations among physicians and nurses compared to before the COVID pandemic, while Chinese nurses did not.
7. Satisfaction of the Chinese nurses with people's good performance in following protocols and vaccinations was declared, but Iranian nurses declared public cooperation was poor, especially at the beginning of the pandemic.
8. Iranian managers visited the quarantine wards on a daily basis to talk closely with the nurses and quickly address their concerns.
9. Forming a respiratory team to control the daily settings of ventilators and frequently control the quality of nursing care by head nurses and supervisors, assigning a team based in the hospital to respond in person and by phone to patients' families, and limiting the days of hospitalization of patients were among the creative measures of Iranian nurses, which were not seen in interviews with Chinese nurses.
10. In taking care of patients, Iranian nurses achieved the importance of not intubating patients as long as possible.

Table 4: Main categories, categories, and subcategories extracted from the interviews of Iranian nurses

Main Category	Category	Main Subcategory	Exemplary Code
Managers as key elements to overcoming the crisis	1. Justice in human resources management	1.1 Motivating employees	"The hospital administrators provided us with psychological counseling and motivational seminars with an emphasis on job duties."
		1.2 Providing protection and welfare facilities to employees	"Despite the sanctions on Iran, managers were providing the highest quality and most expensive PPE."
		1.3 Human resource management mechanisms	"To compensate for the nursing shortage, administrators hired nurses on 89-day contracts."
	2. The art and science of comprehensive nursing care	2.1 Patient education	"Patients were educated about using masks in the ward and at home, disinfecting the bathroom, and quarantining the patient for 14 to 21 days upon discharge."
		2.2 Nursing precautions in oxygen therapy of COVID-19 patients	"we taught patients to coordinate breathing with the NIV mask and staying with the patient for the first 20 min, led to the patient's acceptance of NIV and no need for intubation."
		2.3 Team work	"Daily training of nurses by medical experts led to improved relationships between doctors and nurses and increased nurses' awareness."
		2.4 Sacrifice of nurses in the fight against COVID-19	"Stabilization of patients' hemodynamic status after being calmed by nurses and communicating with them."
	3. Managers as agents of change in crisis	3.1 Changes in the management of hospitalized COVID-19 patients'	"Separating patients with stable hemodynamic status rooms from those with critical conditions had a significant psychological impact."
		3.2 Strengthening physical infrastructure of hospital	"A separate CT scan machine was dedicated to COVID-19 patients."
		3.3 Management measures to provide high-quality care	"Nursing managers during visits monitored the quality and accuracy of nursing care."
	4. Challenges and its management	4.1 Psychological consequences of COVID-19 on nurses	"Seeing so many patients die every day, working so many shifts, and being constantly in the hospital caused burnout."
		4.2 Managers' concern regarding nurses' intention to leave profession	"A large number of nurses resigned early in the pandemic."
		4.3 Challenges related to PPE	"Nurses were developing skin eczema due to prolonged use of PPE."
		4.4 Challenges caused by the emergence of COVID-19	
		4.5 The challenge related to the rejecting of nurses to being appreciated	" Data was constantly changing about how COVID was transmitted from surfaces and the air, and precautions for healthcare workers were changing accordingly."
	5.Psychological management of COVID-19 patients	5.1 Psychiatric counseling for anxious patients	" Patients whose stress was not controlled by nurses were requested to seek psychological counseling."
		5.2 Playing music and positive news	" Music and good news were broadcast on television for the patients."
		5.3 Psychological support of the nurse to the patient	" Nurses provided psychological support to patients."
	6. Mismanagement of COVID-19 at the beginning of the pandemic	6.1 Inadequate financial and psychological support for nurses	" Nurses felt the need for psychological support."
		6.2 Lack of universal holidays in the country	"Businesses and markets did not close at the beginning of the pandemic."
		6.3 Not following preventive protocols by public	"At the beginning of the pandemic, people would ride buses and taxis without masks."
		6.4 Shortage of equipment, manpower, PPE, and medicine	"At the beginning of the pandemic, PPE were not enough.

PPE=Personal Protective Equipment

11. Iranian managers were concerned that nurses would leave the hospital. However, this concern was seen in the talks of the Chinese nurses.
12. In the interview with Iranian nurses, it was seen that sometimes the physicians implemented the protocols the way they wished.
13. Utilizing operating room nurses and anesthesia nurses and signing 89-day contracts with other nurses in order to compensate for the shortage of manpower were among the measures of Iranian managers.
14. Giving free medicine to infected Health Care Workers (HCWs) and holding motivational webinars were among the measures taken by Iranian managers to motivate medical staff, which was not seen in the statements of Chinese nurses.
15. Making it possible for the family to visit their patient only in special cases was seen in the interviews with Iranian nurses, but the Chinese nurses did not allow visits at all.

The similarities of extracted categories from interviews with Iranian and Chinese nurses included the following:

1. Both Chinese and Iranian nurses were facing the challenges of human resources and equipment. In terms of equipment, both groups complained the shortage of PPE and Intensive Care Unit (ICU) beds, failure of equipment due to excessive use, and inappropriate size of equipment.
2. In both countries, the nurses that came to help from other hospitals faced challenges in the destination hospital, such as being unfamiliar with the hospital system and routines.
3. Both Iranian and Chinese nurses received a great deal of psychological support from their family and people. On the other hand, both groups tried to provide care based on humanity and empathy with patients.
4. Both nurses and patients in both countries experienced periods of frustration and emotional exhaustion under psychological pressure.
5. The experience of physical fatigue was seen in both nursing groups.
6. Feeling of uncertainty of the future, fear of transmitting contamination to the family, and feeling of being rejected by others can be understood from Chinese and Iranian nurses' statements.
7. The cooperative performance of HCWs was seen more than before in both countries.

Utilizing skilled HCWs, using common protocols for the care and treatment of patients, was one of the joint actions of both countries.

The rapid change of diagnostic and treatment protocols confused nurses and physicians of both countries.

Discussion

This study aimed to compare the strategies used by Iranian and Chinese nurses for management of patients with COVID-19. Since previous studies have dealt with the experiences of nurses in caring for patients with COVID-19, there were not many data available about the management strategies of nurses from other countries to compare with Chinese and Iranian nurses.

We have seen several significant pandemics in the past 20 years. Health systems globally need to strengthen workforce capacity to effectively face pandemics and avoid the case fatality and mortality burden we have witnessed with the COVID-19 pandemic.[15]

Nurses in Qatar demonstrated self-care and protective behaviors to overcome their stress.[16] Nurses made conscious effort to stay fit by exercising and eating right.[16,17] On the other hand, neither Chinese nor Iranian nurses reported the ways used for adapting their mental pressures.

The lack of previous experience working with emerging infectious disease by nurses impacted initial assessments of risk and skill level.[18] Iranian nurses stated this exactly, but Chinese nurses had previous experiences of exposure with new emerging infectious diseases. Hence, Chinese nurses experienced less fear and they were more skilled in facing COVID-19. Education, team cohesiveness, and community support were reported by Iranian nurses as key elements of controlling COVID-19.[19] An Iranian study reported that not only the general public did not take the disease seriously but also the quarantine regulations were not strictly implemented for contaminated cities.[20] Community support including vaccination and preventive protocols were followed better by Chinese people.

Lack of motivation was stated as a factor which made permanent and stressful situations.[21] Iranian nurses were motivated through motivating webinars.

In the previous studies like the current study, nurses found wearing PPE for long hours uncomfortable and was associated with reports of sweating, headache, suffocation, and injuries to the face. Some nurses also questioned the quality of the PPE provided by the hospital.[18,22] Nurses in Qatar were practicing extra safety measures, such as washing uniforms separately, sealing mobile phones with plastic, and wearing N95 mask on top of a surgical mask, without existing proof of reducing the risk of infection during the time of this study.[16]

Family visits were prohibited to prevent further spread of the infection because of hospital policy. This led nurses to use their smartphones to connect patients with their loved ones causing ethical dilemmas on privacy and hospital rules.[16] Iranian nurses in special cases like pregnant women and schizophrenia patients let a member of family meet the patient under special conditions using PPE.

Nurses had to adapt with policies, protocols, nursing skills, and the new workplace without orientation.[18] Chinese participants of this study stated that they were trained in the simulation wards and passed exams to have

permission to go inside the COVID-19 wards. But Iranian participants stated that ICU nurses were chosen for care of COVID-19 patients; then after their entrance to the COVID-19 wards, they were trained.

Results of the study of LoGiudice and Bartos (2021)[23] reflected both uncertainty ("What's the protocol today?") and certainty ("Proud to be a nurse"), which is similar to the experience of Chinese and Iranian nurses in this study.

Considering these similarities and differences of Iran and China for managing COVID-19 pandemic, using these experiences for the future pandemic by health decision makers is recommended.

Since this study was conducted during the COVID-19 pandemic, not only accessibility of the nurses for interview was difficult due to the large number of their shifts and fatigue but also to conduct a face-to-face interview was burdensome. In some cases, the interviews were not completed in one session and were conducted in two sessions, which added to the difficulty. We tried to overcome these limitations by considering nurses' free time for a long time and increasing the number of sessions in some cases.

Conclusion

The results of this study showed that Iranian and Chinese nurses provided care based on love and commitment to responsibility. However, Chinese nurses, at the management level, attached more importance to the process of training and preparing nurses to enter the quarantine wards of COVID-19, the use of smart phones to reduce the risk of transmission of infection between HCWs, and nurses' living alone in hotel to prevent them from going home. Iranian nurses, at the management level, took measures such as limiting the days of hospitalization of patients, forming a respiratory team to control the settings of ventilators, daily visits of the wards by managers, and employing operating room and anesthesia nurses to compensate for the shortage of nurses.

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Conflicts of interest

Nothing to declare.

References

1. World Health Organization. Director-General's remarks at the media briefing on 2019-nCoV on 11 February 2020. Available from: https://www.who.int/dg/speeches/detail/who-director-general-sremarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020. [Last accessed on 2020 Feb 12].
2. Pearson CM, Mitroff II. From crisis prone to crisis prepared: A framework for crisis management. 1st ed. Risk management. Academy of Management Perspectives: Routledge; 2019. p. 185-96.
3. Team E. The epidemiological characteristics of an outbreak of 2019 novel coronavirus diseases (COVID-19)—China, 2020. China CDC weekly 2020;2:113.
4. Al-Rousan N, Al-Najjar H. Is visiting Qom spread COVID-19 epidemic in the Middle East? Eur Rev Med Pharmacol Sci 2020;24:5813-8.
5. Available from: https://www.worldometers.info/coronavirus/. [Last accessed on 2025 Aug 25].
6. Sriharan A, Hertelendy AJ, Banaszak-Holl J, Fleig-Palmer MM, Mitchell C, Nigam A, *et al*. Public health and health sector crisis leadership during pandemics: A review of the medical and business literature. Med Care Res Rev 2022;79:475-86.
7. Hertelendy AJ. COVID-19 pandemic: An analysis of what is working, what we have learned thus far, and the challenges that remain ahead. J Emerg Manag 2020;18:7-8.
8. Coe E, Enomoto K, Finn P, Stenson J, Weber K. Understanding the hidden costs of COVID-19's potential impact on US healthcare. McKinsey and Company. 2020.
9. Harter J. COVID-19: What employees need from leadership right now. Gallup Workplace. 2020.
10. Hatami H, Sjatil PE, Sneader K. The toughest leadership test. McKinsey and Company. 2020.
11. Ahmadidarrehsima S, Salari N, Dastyar N, Rafati F. Exploring the experiences of nurses caring for patients with COVID-19: A qualitative study in Iran. BMC Nurs 2022;21:16-22.
12. Robinson R, Stinson CK. The lived experiences of nurses working during the COVID-19 pandemic. Dimens Crit Care Nurs 2021;40:156-63.
13. Graneheim UH, Lundman B. Qualitative content analysis in nursing research: Concepts, procedures and measures to achieve trustworthiness. Nurse Educ Today 2004;24:105-12.
14. Guba EG, Lincoln YS. Fourth generation evaluation. Newbury Park, CA: Sage; 1989.
15. Bhadoria P, Gupta G, Agarwal A. Viral pandemics in the past two decades: An overview. J Family Med Prim Care 2021;10:2745-50.
16. Villar RC, Nashwan AJ, Mathew RG, Mohamed AS, Munirathinam S, Abujaber AA, *et al*. The lived experiences of frontline nurses during the coronavirus disease 2019 (COVID-19) pandemic in Qatar: A qualitative study. Nurs Open 2021;8:3516-26.
17. Ross A, Bevans M, Brooks AT, Gibbons S, Wallen GR. Nurses and health-promoting behaviors: Knowledge may not translate into self-care. AORN J 2017;105:267-75.
18. Nelson H, Hubbard Murdoch N, Norman K. The role of uncertainty in the experiences of nurses during the Covid-19 pandemic: A phenomenological study. Can J Nurs Res 2021;53:124-33.
19. Catania G, Zanini M, Hayter M, Timmins F, Dasso N, Ottonello G, *et al*. Lessons from Italian front-line nurses' experiences during the COVID-19 pandemic: A qualitative descriptive study. J Nurs Manag 2021;29:404-11.
20. Mokhtari R, Yaghoobzadeh A, Abdi K, Sajadi M, Jaras M, Golitaleb M. The experiences of nurses in care provision to COVID-19 patients: A qualitative study. Front Public Health 2022;10:766880.
21. Pritchard R, Ashwood E. Managing motivation: A manager's guide to diagnosing and improving motivation. Routledge; 2008.
22. Vidua RK, Chouksey VK, Bhargava DC, Kumar J. Problems arising from PPE when worn for long periods. Med Leg J 2020;88(1_suppl):47-9.
23. LoGiudice JA, Bartos S. Experiences of nurses during the COVID-19 pandemic: A mixed-methods study. AACN Adv Crit Care 2021;32:14-26.