

ORIGINAL ARTICLE

Information flow and nursing care during the early phase of the COVID-19 pandemic

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Abstract

Aims: This study aimed to understand the dissemination of information relating to coronavirus disease 2019 (COVID-19) and its impact on nursing care in the early phase of transmission.

Background: COVID-19 has spread globally, causing an unprecedentedly large number of casualties. Nurses face challenges in dealing with patients with COVID-19 with limited information about the pathogen.

Design: This qualitative study followed the COREQ guidelines.

Methods: Fifteen nurses were recruited from two university hospitals in South Korea using a snowballing technique for in-depth interviews in May 2020. All interviews were recorded and transcribed verbatim. Content analysis was performed on the interview data.

Results: Two themes emerged: access to COVID-19 information and the impact of information on nursing care. The categories of access to COVID-19 information were lack of nursing-specific information, limited information cascading from top management and confusion due to varying points of view. The categories of the impact of information on nursing care were unprepared management that aggravates exhaustion, lack of personal protective equipment that creates anxiety and being a nurse leader to overcome the pandemic.

Conclusion: During a pandemic of emerging infectious diseases, nurses should have access to up-to-date information tailored to their working environment. Human resources, material resources and systematic support are needed for nurses who provide care for patients with an infectious disease.

Relevance to clinical practice: A collaborative interprofessional education system for emerging infectious diseases is needed for effective communication and consistent care during a pandemic. Nurse leaders should be prepared to deliver profession-specific information for standardised care and respond to nursing management needs by using resources and tailoring the workforce.

KEYWORDS

infectious diseases nursing, information needs, nursing information systems, qualitative study, registered nurse

1 | INTRODUCTION

The world has witnessed emerging infectious diseases in the past. Some of the recent deadly viruses that have caused a pandemic were severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) since December 2019, avian influenza in 2018, Ebola between 2014 and 2016 and Zika virus in 2015. However, no other emerging infectious disease has paralysed global society and healthcare systems within a few weeks like coronavirus disease 2019 (COVID-19). COVID-19 is associated with minor symptoms in some patients and fatal conditions, such as acute respiratory distress syndrome, organ failure and death, in older adults with underlying diseases (Guo et al., 2020). Even though care guidelines and the need for health policy for COVID-19 have been announced by the International Council of Nurses (Catton, 2020), it is challenging to embrace universal situations (Lamontagne & Angus, 2020). With limited knowledge of this emerging infectious disease in the early phase of the pandemic, health professionals find it difficult to obtain evidence-based information to provide care for patients with suspected or confirmed COVID-19.

Thus, this study aimed to understand the dissemination of COVID-19-related information and nursing care. By exploring nurses' experiences and perceptions of information usage during the COVID-19 pandemic in the early 2020, it would be useful to revise the health information systems in hospitals.

2 | BACKGROUND

The COVID-19 pandemic is not the first outbreak of an emerging infectious disease in South Korea. In 2015, South Korea was the centre of the Middle East respiratory syndrome (MERS) epidemic. The spread of MERS from Korean hospitals was alarming in terms of the initial failure of response to MERS due to many factors such as a lack of isolation of close contacts, subsequent failures to conduct pre-emptive quarantines and the failure of appropriate crisis communication from governmental level (Kim et al., 2017). During this outbreak, the roles of nurses changed to adapt to the needs of patients, their families and the hospital and were pivotal in controlling the epidemic; however, hospital management was not prepared to provide proper guidelines to health professionals during the early phase of the pandemic (Stirling, 2017). Since the guidelines kept changing without considering nurses' adaptations to new recommendations, nurses were confused about best practices during the MERS outbreak (Kang et al., 2018). After the MERS outbreak ended, new guidelines were adopted for infection control in hospital settings. However, because the MERS epidemic only lasted for a few weeks in limited areas, the health delivery system did not undergo a transformation in preparation for the next epidemic. South Korea was confronted with a similar situation in 2020 with the spread of COVID-19.

To properly respond to and prevent pandemics of emerging infectious diseases such as COVID-19, it is vital for health institutions

What does this paper contribute to the wider global community?

- Nursing-specific information for COVID-19 should be developed for evidence-based care.
- During the COVID-19 pandemic, health professionals of different disciplines should have unified levels of knowledge to provide care.
- Nursing human resource and material resource management staff should be fully considered in response to the pandemic situation.
- It is crucial for nurses to manifest leadership in infection control during the COVID-19 pandemic.

to have access to the information they need (Siegfried et al., 2017). Obtaining accurate health information facilitates positive patient outcomes because nurses can make proper decisions (Zigdon et al., 2020). Conversely, when nurses feel that their source of information is unreliable, the quality of nursing care is compromised since decision making is difficult (Cranley et al., 2009). During the MERS outbreak, nurses were busy keeping up with the frequently changing guidelines and the need to share new information (Kang et al., 2018). Nurses barely had knowledge about the pathogen, its transmission, diagnostic testing and treatment, which increased confusion and insecurity (Lam et al., 2018).

Acquiring evidence-based health information is necessary for nursing competencies (American Library Association, 2013). Nurses work in an environment that can harm the patient when pertinent information is unknown; clear communication is essential because patients are more prone to adverse events than any other acute care settings (Bonds, 2018). With outbreaks of emerging infectious diseases such as COVID-19 where few evidence-based interventions have been established, nurses need to obtain new information along with guidelines from health institutions. In addition to the rapid spread of COVID-19, relevant information has flooded social network services globally (Depoux et al., 2020). During this stream of health information, very little information was evidence-based, and there was not much health information that health professionals could rely on. Previous studies have reported that during outbreaks of emerging infectious diseases, nurses obtain information using various resources (Lam et al., 2018). For example, approximately one out of five nurses in Israel acquired health information on social media (Zigdon et al., 2020). Nurses relied on health information based on their personal experiences (Stone et al., 2016). Thus, exploring how ICU nurses retrieve and use health information is important because clear communication is vital to prevent severe and life-threatening consequences.

After the MERS outbreak, public awareness of the epidemics somewhat increased, and with the onset of COVID-19, the preparedness of hospital nurses for a pandemic is discussed again. Due to increased international transmission, COVID-19 is more pervasive

than previous outbreaks. However, there is a lack of research on the practical perceptions of nurses related to the international spread of COVID-19. Therefore, exploring the flow of COVID-19-related information among nurses and how this changes nursing care from their perspectives is crucial.

3 | METHODS

3.1 | Study design

We used a qualitative approach to understand information flow among nurses during the early phase of the COVID-19 pandemic and its impact on nursing care. The Consolidated Criteria for Reporting Qualitative Studies guidelines were followed (COREQ; Tong et al., 2007; see File S1).

3.2 | Data collection

During the early phase of COVID-19 when data collection took place, patients who were suspected of having COVID-19 in South Korea were transferred to the ICU for monitoring. Therefore, the participants in this study were nurses who had been working in an ICU for at least one year and had experience taking care of patients with suspected COVID-19. After approval from Institutional Review Board, participants were recruited from two university hospitals in a metropolitan area of the South Korea. Both hospitals were affiliated with one university and had the same nursing model and nursing workforce management system. The recruiting sites, both of which have over 500 beds, operated outpatient COVID-19 screening clinics. When patients had symptoms of suspected COVID-19, they were directly transferred to ICUs and were placed in isolation rooms with negative air pressure and double gates.

Data were collected from 5 May to 30 May 2020. We had two key informants who promoted the study at each recruiting site. Those who were interested in the study voluntarily contacted the researcher via email. Using a snowballing technique, 15 ICU nurses were recruited without dropouts. After obtaining informed consent, face-to-face, one-on-one interviews were conducted with participants in private locations. Key interview questions included the following: (a) Where do you obtain information about COVID-19 for nursing care? (b) What efforts did you make to obtain up-to-date information related to COVID-19 patient care? (c) What are the issues related to the care of patients with suspected COVID-19? (d) Could you share your nursing care experience regarding COVID-19? (e) How did the COVID-19 pandemic impact nursing care and your personal life? Interviews lasted between 41 and 97 min (mean = 53 min) without a repeated interview. One researcher (RN, Master of Nursing Science, female) took the lead in the interviews. During the interview, the researcher carefully observed nonverbal expressions from participants, such as facial expressions, behaviour and

tone, and transcribed them into the field notes. All the interviews were recorded and immediately transcribed verbatim. Another researcher (RN, Doctor of Philosophy, female) reviewed the interview contents and guided the interview questions on a regular basis. Data collection and data analysis were iterative processes; after the interview with participant 13, researchers decided that the saturation was reached because no new information was found.

3.3 | Analysis

Interviews and field notes were analysed using traditional content analysis (Hsieh & Shannon, 2005). The researchers who had research experience in qualitative studies listened to the recorded interview multiple times and repeatedly read the transcribed content to understand the overall meaning. By constantly reading the transcripts, meaningful statements such as words, phrases or sentences were extracted for this study. Using NVivo 8 (QSR International, Melbourne, Australia), 360 meaningful statements were extracted. Each meaningful statement was labelled as a code. The codes were compared and grouped based on underlying relational aspects. Six categories were combined based on the interview contents and field notes. Two main themes were derived from the unanimous agreement of the researchers. Minor attributes were excluded from the analyses. Finally, the phenomena through the analysis and integration of attributes were described.

Rigour in this study was achieved using the criteria suggested by Lincoln and Guba (1985). To ensure credibility, researchers reviewed the content after each interview with the participants. The extracted codes and the narrative descriptions were confirmed by two participants. We had comments from the participants that the findings were in accordance with the context of the interviews. To ensure transferability, the findings were described in detail to provide a thick description of the phenomena. The demographic characteristics of the participants were also fully stated. For dependability, the researchers wrote research notes throughout the process to create an audit trail. To reach confirmability, the researchers shared our preconceptions that ICU nurses would have a hard time caring for COVID-19 patients such that they might be willing to leave their work. We took a note about the preconceptions before conducting interviews so as not to be mixed up with participants' statements.

4 | RESULTS

Fifteen nurses participated in the interviews (Table 1). Fourteen were females, and one was male, aged between 25 and 32 years. The average clinical working year was 2 years and 8 months (range: 1 year and 2 months to 4 years). At the time of data collection during the comparatively early phase of COVID-19, every suspected patient was sent to the ICU for close monitoring. One hospital where nine participants were recruited was built in less than two years ago, so it

TABLE 1 Demographics of interviewed nurses (N = 15)

Nurse	Sex	Age (years)	Education level	Hospital	Department	Length of clinical work experience
1	Female	27	Bachelor	A	MICU	3 years and 3 months
2	Female	29	Bachelor	A	SICU	4 years
3	Female	28	Bachelor	A	EICU	4 years
4	Female	30	Bachelor	B	CCU	3 years and 6 months
5	Female	26	Bachelor	A	EICU	2 years and 6 months
6	Female	25	Bachelor	B	NCU	1 year and 2 months
7	Female	27	Bachelor	B	EICU	1 year and 2 months
8	Female	25	Bachelor	A	EICU	1 year and 2 months
9	Female	25	Bachelor	B	CCU	1 year and 2 months
10	Male	32	Bachelor	A	EICU	4 years
11	Female	30	Bachelor	A	MICU	2 years and 8 months
12	Female	30	Bachelor	A	MICU	3 years and 8 months
13	Female	27	Bachelor	B	NCU	3 years and 3 months
14	Female	26	Bachelor	B	MICU	1 year and 2 months
15	Female	28	Bachelor	A	EICU	3 years and 3 months

Abbreviations: CCU: cardiac intensive care unit; EICU: emergency intensive care unit; MICU: medical intensive care unit; SICU: surgical intensive care unit.

TABLE 2 Themes and categories from data analysis

Themes	Categories
Access to COVID-19-related information	<ul style="list-style-type: none"> • Lack of nursing-specific information • Limited information cascading from top management • Confusion due to varying points of view
Impact of information on nursing care	<ul style="list-style-type: none"> • Unprepared management that aggravates exhaustion • Lack of PPE that creates anxiety • Being a nurse leader to overcome the pandemic

has high-tech isolation facilities unlike the other hospital. However, because both hospitals had the same nursing model, no distinction in the COVID-19 care experience of nurses was reported. The two themes that emerged are listed in Table 2.

4.1 | Access to COVID-19-related information

4.1.1 | Lack of nursing-specific information

Participants received information related to COVID-19 that was focussed on infection control, such as the use of personal protective equipment (PPE) and environmental control for infection prevention, and updates on the outbreak, such as the number of patients diagnosed with COVID-19. Participants highlighted the lack of nursing-specific information for providing care to patients with COVID-19 during the pandemic. One participant described the following: "The hospital does not update the information about COVID-19 patient care. The guidelines are focused on infection control during the admission process" (p. 7). One participant

described the lack of information about new procedures related to COVID-19: "At the beginning of the pandemic, I actually didn't receive training for the testing procedure for COVID-19, but I had to administer the test anyway" (p. 2). The participants had to learn the procedure themselves. However, this process is not easy because of the limited information related to COVID-19. Several participants said that they did not have information regarding evidence-based care during the pandemic. However, they were afraid of obtaining information about COVID-19 from outside the hospital. Participants believed that the plethora of information flooding the news and media was not reliable. Consequently, their knowledge of COVID-19 was restricted to what was delivered to them in their workplaces.

4.1.2 | Limited information cascading from top management

Guidelines for COVID-19 infection control were delivered from the hospital to the head nurse in each department and staff

nurses during the handover. This was a one-way channel: staff nurses did not have any open channels to ask questions or discuss the newly delivered guidelines. One participant stated the following: "New guidelines from the hospital are delivered during a handover. Then, we just followed the instructions" (p. 4). The participant continued:

I know there are two ways to test for COVID-19: nasal swab specimen and sputum collection. In the beginning, we routinely performed these two diagnostic tests, but at some point, we did not test sputum anymore. When the guidelines are changed, I would have liked to have known the reason, but I did not receive any explanation from the hospital. It was a quite puzzling experience. (p. 4)

While information flowed from the top down, nurses showed passive attitudes when acquiring information. Some were already exhausted with their increased workload and did not have the energy left to search for more information about COVID-19. One participant confessed, "I tried to learn about COVID-19 at the beginning of the pandemic, but... now, there is no time to search for information" (p. 13).

4.1.3 | Confusion due to varying points of view

At the beginning of the COVID-19 pandemic, hospital guidelines were constantly changing. For example, airborne precautions were first considered for COVID-19. Subsequently, droplet precautions were added. Furthermore, the criteria for PPE and screening tests changed without valid explanations being provided to the nurses. These constantly changing guidelines yield different levels of information among health professionals, thus resulting in the lack of confidence in providing care and maintaining infection control.

These days, patients with respiratory symptoms tend to take COVID-19 tests. However, even though some patients have a fever and respiratory symptoms, they do not get COVID-19 test and are admitted. I am not sure who is right or wrong. The whole situation is confusing. (p. 1)

The participants did not receive official staff training for the COVID-19 outbreak. Occasionally, the speed of delivery of the guidelines differed among health professionals. Each profession in the hospital has a unique pathway for delivering information to professionals. This aggravated the confusion. For example, nurses would adopt the recent guidelines to screen patients with suspected COVID-19, while other hospital staff would apply the previous guidelines. Different information without supporting evidence existed in the hospital. Consequently, participants did not feel confident when they provided care because they did not fully trust the guidelines.

4.2 | Impact of information on nursing care

4.2.1 | Unprepared management that aggravates exhaustion

Human resource management did not respond promptly to the COVID-19 pandemic. As a result, participants revealed that they were not systematically supported. During the COVID-19 pandemic, participants were exhausted and had an increased workload due to the need for infection control. One participant stated, "Before we start to work, we became to count masks routinely. When there is an unmet count, it would be chaotic. So, I kept the mask in my locker not to lose it. A new task is added" (p. 3). When nurses were caring for suspected COVID-19 patients, they had to wear PPE such as gloves, masks, shoe covers and level D protection gowns.

Participants were also in charge of other patients, so they had to put on and remove PPE several times during their working hours. However, no additional nursing staff were added in response to the increased workload. In addition to the increased workload, they experienced physical difficulties such as sweating, dizziness and blurred eyesight while wearing PPE. They were also unable to have breaks because of the workload and limited nursing workforce.

Participants had difficulties communicating with each other due to lack of communication tools. Nurses in a negative pressure room could not communicate with other nurses for patient care. They attempted to use a call bell, but it was not effective when wearing a level D gown. One participant stated the following: "When I am in the negative pressure room, I can barely hear what the nurses outside the room are saying to me. We do use a call bell to communicate, but it is useless" (p. 1). Another participant recalled having an emergent situation in the negative pressure room and expressed the difficulties she experienced: "There was once a cardiac arrest situation in the negative pressure room, so we need to intubate the patient. However, the room was too small to allow other nurses and physicians to come in. What was worse, it took some time to wear PPE" (p. 1).

4.2.2 | Lack of PPE that creates anxiety

With limited information and insufficient PPE, participants revealed that they experienced anxiety about becoming infected and spreading the virus to the patients or others. Not all nurses were able to wear level D protection gowns. Sometimes, all they had were surgical masks and gloves. The lack of PPE made them feel vulnerable to infection. At times, they were told to reuse the PPE without evidence-based guidelines.

We did not even have an adequate number of KF94 (Korean filtered mask that can block more than 94% of particles with an average size of 0.4 μM) or surgical masks. Today, I used the mask that I wore yesterday. At least, I do not want to be stressed out about protecting myself from infection. (p. 5)

Many nurses were emotionally exhausted due to increased workload and uncertainty. They feared that they might become infected with COVID-19. One participant stated the following: "I texted my colleagues a lot, and they all said they couldn't sleep because they were nervous about getting infected" (p. 14). Some nurses living with their families were particularly worried about becoming infected and spreading COVID-19 to their families. They regarded themselves as potential sources of COVID-19 and were obsessed with hygiene even in outside of work: "I feel like I am obsessed with hand washing. I know I wash my hands obsessively, but I would feel guilty if I did not do that" (p. 4).

4.2.3 | Being a nurse leader to overcome the pandemic

Being faced with an unexpected pandemic increased the participants' awareness of infection control. They felt responsible for controlling infection, which continued outside their work. They meticulously followed the guidelines for infection control and actively engaged in social distancing to limit the chances of becoming infected. One participant said, "I am trying to be more careful not to go outside when I have a day off because I am a nurse who is in charge of taking good care of patients with suspected COVID-19" (p. 10). Another participant stated, "I wash my hands right after I get home. I also always carry hand sanitizers in my car because I work with patients who could be vulnerable to infection" (p. 2). Participants stated that as nurses they felt responsible in eradicating the virus by actively participating in infection control. One participant stated, "As a nurse who takes care of COVID-19 suspected patients, I really want to beat the COVID-19 pandemic. I have a sense of responsibility" (p. 4).

Nurses struggled with their psychological difficulties. They felt overwhelmed by the pandemic situation and sometimes showed despair due to a lack of stress outlets. However, the participants tried to endure the difficulties by supporting each other and by trying to cope. They tried to refresh themselves by supporting their coworkers. One participant stated, "I received a lot of support from my fellow nurses. Actually, we text a lot about this situation and share our feelings to support each other" (p. 14). Some started using relaxation techniques such as meditation to remain strong as gatekeepers of infection control in this stressful pandemic situation.

5 | DISCUSSION

The world was in the process of learning about COVID-19 in the first few months of 2020. Although information was being delivered to nurses, the level and scope of information related to COVID-19 were not far from that of the general population. Hospitals were delivering infection control guidelines such as the droplet or airborne nature of the disease and the number of patients diagnosed with COVID-19. However, nurses needed nursing-specific information to provide evidence-based care (Stirling, 2017). For example, protocols

are being developed for ICU nurses to provide tailored care for intubation, airway management and cardiac arrest for patients with COVID-19 (Griffin et al., 2020). In addition, there was a one-way flow of information from hospital authorities to nurses: therefore, nurses passively received information. Maintaining an online discussion board for hospital staff might be helpful for the exchange of valuable and up-to-date information.

Nurses are frontline care providers who need to collaborate to provide the best up-to-date care to patients. However, the information received by health professionals from other disciplines was incongruent during the COVID-19 pandemic. In a nationally emergent environment such as the COVID-19 pandemic, authorities such as the Centers for Disease Control (CDC) need to provide information to the general public as well as to health professionals. Outbreaks of different pandemics, such as SARS, Ebola and MERS, have been reported from time to time. Whenever these pandemics came to a lull, the need for in-house staff training on infection control measures should be emphasised (Cohen, 2011). Interprofessional education and collaborative practice could contribute to congruent care delivery to patients during an emergency such as a pandemic. With the emergence of COVID-19, healthcare workers should be trained on treatment strategies and new procedures for COVID-19 patients, such as airway management and cardiopulmonary resuscitation, so that health professionals from various disciplines could communicate more effectively for the best patient outcome and in preparation for future pandemics. Moreover, based on the CDC-released information for health professionals, tiered training is required. Profession-specific or setting-specific staff training should be provided.

The nurses in this study experienced difficulties due to increased workload because they were taking care of the same number of patients during the pandemic with limited support in terms of guidelines and PPE. Monitoring and management of the nursing workforce to promptly respond to the altered workloads are necessary. Adopting diverse strategies to meet the manpower supply is one key feature in responding to the COVID-19 pandemic (Gao et al., 2020; Tsay et al., 2020). Strategies such as delaying other care to increase the capacity of the ICU for mass critical care needs are suggested (Wurmb et al., 2020). In addition to these strategies, PPE should be prepared for nurses. A recent study revealed that nurses have a considerably increased the risk of becoming infected with SARS-CoV-2, and more than half of the infected health professionals were nurses (Barrett et al., 2020). Globally, health professionals caring for patients with COVID-19 have reported concerns about their health (Paffenholz et al., 2020). The experience of the COVID-19 pandemic provided lessons for healthcare institutes on how to prepare for an unexpected surge of emerging infectious diseases, such as by storing PPE and maintaining a flexible nursing workforce based on the number of patients and disease severity.

Nurses have a sense of duty as health professionals and attempt to demonstrate leadership and compassion during the pandemic. In addition to their leadership, systemic support can encourage frontline health professionals. Ample evidence exists regarding the need for support for psychological difficulties, such as depression and

anxiety, among frontline health professionals caring for patients with COVID-19 in China (Lai et al., 2020), India (Spoorthy, 2020), Canada (Stelnicki et al., 2020), Switzerland (Weilenmann et al., 2020) and Iran (Hosseinzadeh-Shanjani et al., 2020). Nurse leaders should be prepared to fully support staff nurses during the pandemic to ensure quality patient care and promote self-care for nurses (Hofmeyer & Taylor, 2021).

One strength of this study was the interview method that was used to explore nurses' perceptions and experiences about dealing with COVID-19; most previous studies used surveys. Second, this study focussed on the access and impact of COVID-19-related information that prevailed in and out of hospitals among nurses. Nevertheless, this study had several limitations. First, it was conducted in two hospitals in Korea, so it is difficult to generalise the findings in Korea or other countries. Second, data were collected early during the pandemic, so the pattern of information usage may have changed over time. We suggest that further studies in different settings be conducted at the end of the COVID-19 pandemic to explore how the information has changed as a whole.

6 | CONCLUSION

With the flood of COVID-19-related information, identifying optimal information for nursing care is challenging. However, to end COVID-19 and prevent further pandemics, standardised and reliable information outlets for all health professionals should be promoted to contribute to better patient outcomes and cost-effective care. Up-to-date and tailored information for each health profession should be established and provided via a centralised platform of an information outlet. Health professionals also need human resources, material resources and systematic support.

7 | RELEVANCE TO CLINICAL PRACTICE

A standardised information system among health professionals is important for providing timely and quality patient care. This study explored how the COVID-19-related information is used and its impact on nursing care. A collaborative interprofessional education system for emerging infectious diseases is needed for effective communication and consistent care during pandemic situations. Nursing leaders should be prepared to deliver profession-specific information for standardised care and respond to nursing management needs by using resources and tailoring the nursing workforce.

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CONFLICT OF INTEREST

There are no known conflicts of interest associated with this work, and there has been no significant financial support for this work that could have influenced its outcome.

AUTHOR CONTRIBUTIONS

Chiyoung Cha was involved in the study design, data analysis and writing. Suhyun Park was involved in the data collection, data analysis and writing.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

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