

Working experiences of nurses during the Middle East respiratory syndrome outbreak

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Abstract

Aims: To explore working experiences of nurses during Middle East respiratory syndrome outbreak.

Background: Since the first case of Middle East respiratory syndrome was reported on May 20, 2015 in South Korea, 186 people, including health care workers, were infected, and 36 died.

Design: A qualitative descriptive study.

Methods: Seven focus groups and 3 individual in-depth interviews were conducted from August to December 2015. Content analysis was used.

Results: The following 4 major themes emerged: “experiencing burnout owing to the heavy workload,” “relying on personal protective equipment for safety,” “being busy with catching up with the new guidelines related to Middle East respiratory syndrome,” and “caring for suspected or infected patients with caution.” Participants experienced burnout because of the high volume of work and expressed safety concerns about being infected. Unclear and frequently changing guidelines were 1 of the common causes of confusion. Participants expressed that they need to be supported while caring for suspected or infected patients.

Conclusion: This study showed that creating a supportive and safe work environment is essential by ensuring adequate nurse staffing, supplying best-quality personal protective equipment, and improving communication to provide the quality of care during infection outbreak.

KEYWORDS

burnout, infection control, Middle East respiratory syndrome, nurses, outbreak

SUMMARY STATEMENT

What is already known about this topic?

- Infectious disease outbreaks cause a significant level of distress and fear among nurses.
- Nurses are near to patients, even when they have life-threatening infectious diseases.

- Little is known about the work experiences of nurses during the Middle East respiratory syndrome coronavirus outbreaks.

What this paper adds?

- High volume of work and fear of infection appear to be the main concerns among nurses during the outbreak.
- Nurses were confused about best practices because of lack of clarity of the guidelines during the outbreak. However, sharing

information on the new guidelines and job-related information via text messages using smartphones was helpful for the nurses.

- Creating a supportive work environment and providing adequate training for nurses is essential.

The implications of this paper:

- Nurse managers and hospital administrators should establish strategies to prevent nurses from burnout and to ensure their safety during the outbreak of infectious diseases.
- Clear and consistent practice guidelines and effective communication methods among nurses should be developed.
- Increasing awareness of health care workers about infectious diseases to enhance emergency preparedness is essential.

1 | INTRODUCTION

Worldwide, the potential for emerging infectious diseases is a major global health issue. The Middle East respiratory syndrome coronavirus (MERS-CoV) was first identified in a patient from Saudi Arabia in April 2012 (Al-Tawfiq, Omrani, & Memish, 2016). Camels are considered as a carrier for MERS-CoV transmission in humans. The possible transmission modes are droplet and contact spread (Bhatia, Sethi, Gupta, & Biyani, 2016). The 2015 MERS-CoV epidemic in South Korea has been the largest outbreak of MERS outside Middle East. The first person (index patient) with MERS-CoV in Korea was a 68-year-old man who had returned from the Middle East. This patient visited 3 different medical clinics for the initial symptoms until he was diagnosed with MERS on May 20, 2015, which was 9 days after his first visit (Lee & Ki, 2015; Yang et al., 2015). A MERS outbreak in Korea was caused by hospital-to-hospital transmission because patients were moved to other hospitals without appropriate quarantine (Ki, 2015; Kim et al., 2016). It was exacerbated by overcrowding in the emergency room, delayed diagnosis, and lack of self-protection (Balkhy, Perl, & Arabi, 2016; Xia, Zhang, Xue, Sun, & Jin, 2015).

As more and more MERS cases were reported, hospitals restricted the visitors and checked all visitors and employees for the presence of fever. Additionally, for the temporary screening of MERS-suspected cases, triage was set up to screen the infected or suspicious patients and to block the cross-transmission in and outside hospitals. Furthermore, the government adopted the National Safe Hospital Program to control MERS infections within hospitals (Korea Centers for Disease Control and Prevention, 2015). As part of this program, patients with respiratory disease saw clinicians in secured areas instead of outpatient clinics or emergency rooms, used a separate room in case of hospitalization, and were tested for MERS-CoV before being admitted to the intensive care unit (ICU) to minimize the transmission of the virus. During MERS outbreaks, 186 Koreans had been exposed to MERS in hospitals as of July 15, 2015. Both patients and health care personnel (doctors, nurses, and emergency medical transporters) were confirmed with a MERS-CoV infection across 16 hospitals, and 36 deaths were reported (Balkhy et al., 2016; Korea Centers for Disease Control and Prevention, 2015; Yang et al., 2015).

Along with high risk of being infected, studies reported that health care personnel experienced occupational risks, distress, and the fear of

contacting and transmitting the disease during epidemics of H1N1, severe acute respiratory syndrome (SARS), and Ebola virus (Bukhari et al., 2016; Chou et al., 2010; Corley, Hammond, & Fraser, 2010; Koh, Hegney, & Drury, 2012; Speroni, Seibert, & Mallinson, 2015). Nurses also reported positive experiences of becoming more confident, mature, and broad-minded while caring for SARS patients (Liu & Liehr, 2009) and positive feelings about their experience of caring for H1N1 patients (Honey & Wang, 2013). However, few studies have been conducted on nurses' working experiences during the MERS outbreak. The aim of the study was to explore the working experiences of nurses during the MERS outbreak.

2 | METHODS

2.1 | Study design and participants

We conducted a qualitative descriptive study. Participants were 27 nurses working in 9 university-affiliated hospitals in Seoul and 1 general hospital in Kyongki Province, South Korea. A sample of registered nurses was recruited using maximum variation sampling based on the working experience of MERS. We included staff nurses working in hospitals that had confirmed or suspected cases of MERS. Their nursing units were infection control units, ICUs, emergency rooms, labour and delivery units, and medical units, including respiratory care units.

2.2 | Data collection

Data were collected using 7 focus group interviews and 3 individual in-depth interviews from August to December 2015 until the data were saturated. Focus group questions were developed based on a literature review (Chou et al., 2010; Corley et al., 2010). Each focus group was comprised of 2 to 5 participants. Individual in-depth interviews were conducted for those who were not able to meet in focus groups because of time conflicts. Prior to the interview, participants were informed about the reasons for doing this study and the goals of the study. The first author (HSK), who has experience with qualitative research, conducted the focus groups and the individual in-depth interviews.

The focus group discussions and individual interviews were conducted in a private room at a site with convenient participant access. Each session lasted for 1 to 2 hours. No one was present besides the participants and the researchers during the interviews. A semistructured interview guide was used. We conducted a pilot test with 2 nurses caring for the patients with MERS and refined the interview questions. The following questions guided the interviews:

- What are your working experiences of caring for suspected or infected patients with MERS during the outbreak?
- What are the challenges of working during the MERS outbreak?

To ensure consistency and accuracy of our data, interviews were audio-taped with the participants' permission and transcribed verbatim. The researchers made field notes during and right after the

TABLE 1 Themes, subthemes, and quotations from the interviews

Themes	Subthemes	Quotations
Experiencing burnout owing to the heavy workload	Exhausted because of vigilant monitoring of the person at high risk to break the chain	<ul style="list-style-type: none"> • We had to check several items, such as history of recent travel to the Middle East and of fever, contact with MERS patients, or visiting a hospital with confirmed MERS cases. The list of hospitals with confirmed MERS cases is getting longer and we cannot memorize them anymore. Therefore, we had to print out the list to check it each time. • Caring for patients is already difficult. Besides, we have to check for fever, even in visitors or caretakers (private) and to make a list of such people, with their contact information and report these to the nursing department. • (I) felt overloaded and understaffed.
	Stressed about restricting unauthorized access	<ul style="list-style-type: none"> • Some families of patients complained of our hospital rule that only one caregiver could stay with their patient in the room. • I had complains of requesting more visitor's pass several times. • Visitors who came from far away complained a lot and arguments emerged sometimes.
Relying on personal protective equipment (PPE)	Concerns for safety	<ul style="list-style-type: none"> • I am afraid of being infected with MERS-CoV while caring for patients. I worry about bringing the MERS-CoV infection from the hospital to my family. • The first thought that occurred to me was we could be infected too. • The most sensitive thing about safety equipment was fitting. But I felt the N95 mask was big and air was leaking and wondered this was all right.
	Discomfort of wearing PPE	<ul style="list-style-type: none"> • It's so sweaty and hard to breathe with it. It is hard to work and see clearly while wearing it (protective measures) and I feel dizzy when wearing it for long hours. • (We were) sweating, (find it) hard to breathe; it was difficult to work wearing personal protective equipment.
Being busy with catching up with the new guidelines for MERS	Frequently changing guidelines	<ul style="list-style-type: none"> • MERS guidelines kept changing. At first, (we were told to) do thing this way and this is the guideline. We needed time to understand and practice a new guideline; however, guidelines kept changing without considering our adjustment to a new one. • The most difficult thing was that protocols were changed daily. Working along with memorizing new protocols was very difficult. While workload increased, (we) were told this has been changed this way and that has been changed that way in shift change meetings.
	Sharing the new information	<ul style="list-style-type: none"> • We promptly communicated and shared updated information among nurses within the unit, through <i>Kakao Talk</i> (a free mobile instant messaging application for smartphones with free texting). • We had a notice note summarized about new information on MERS. When changing shifts, we read the note and were also told what we have to be cautious because of what has been changed and it helped. It helped because we never had MERS before and didn't know how we have to send the specimens and did not know how to cope with it. It worked as basic guidelines.
Caring for suspected or infected patients with caution	Lack of support	<ul style="list-style-type: none"> • Why do you have to do it, and what if you are infected? Why? Why does it have to be you? • When the patients' condition was bad and when we were having a hard time, no one showed appreciation of our hard work.
	Identifying the best way to care for patients	<ul style="list-style-type: none"> • After spending many days in the isolated room, we started using a messenger. We supported each other and shared information. It was very helpful for me to ask my colleagues when I was unsure about patient care. • We made a package for MERS patients, a package for MERS. At first, we brought water bottles to patients because they cannot come out a negative pressure room and we complained regarding this matter. Next thing, we agreed to make a package for the patients in the isolation room. When a patient comes, we give this package that has water, sleeper, and disposable products that patients need.

(Continues)

TABLE 1 (Continued)

Themes	Subthemes	Quotations
	Going back to routines feeling valued and appreciated	<ul style="list-style-type: none"> It was very rewarding because I completed the job that others did not want to engage in. I was grateful because my colleagues welcomed me back to the unit and appreciated my hard work. (We) felt appreciated when we were asked what we would like to do. We ended up eating out and had a good time eating and talking together.

MERS-CoV, Middle East respiratory syndrome coronavirus.

interviews to help understand the interviews. There were no repeat interviews carried out.

2.3 | Ethical considerations

The study was approved by the institutional review board (1041078-201506-HRSB-099-01). All participants were informed about the purpose of this study and participants' right to withdraw from the study at any time, without penalty. Confidentiality of participants was ensured, and written informed consent was obtained from each participant.

2.4 | Data analysis

The responses from the participants were analysed, using qualitative content analysis (Krueger & Casey, 2009). Data collection was conducted concurrently with data analysis and continued until no new information emerged from the responses. The researchers read each verbatim transcript several times to obtain an overall understanding of the content and to gain a sense of the whole. The meaning units (words, sentence, and paragraphs) in the interviews related to nurses' work experiences were identified and coded. The codes were sorted into similar things together and grouped into categories based on similarities and differences. After assessing themes across groups, overarching themes were derived. Two of the investigators independently coded each transcript. When discrepancies in coding occurred, the investigators discussed and resolved them by consensus.

2.5 | Study rigour

Trustworthiness of the study was maintained following criteria by Lincoln and Guba (1985). The credibility of the research findings was established with member checking and peer debriefing. Transferability was ensured via thick descriptions of research process. Dependability was achieved by checking the consistency of the findings. The interviewer did not have a relationship with the participants, and this helped to increase the likelihood that participants felt free to tell their stories. Lastly, we reported our study based on the consolidated criteria for reporting qualitative studies (COREQ) (Tong, Sainsbury, & Craig, 2007) to improve the explicit reporting of a qualitative study.

3 | RESULTS

The study participants included 25 female and 2 male nurses. Their mean age was 29.5 (4.7) years, ranging from 20 to 24 years, and their work experience ranged from 3 months to 17 years.

The following 4 major themes emerged: "experiencing burnout owing to the heavy workload," "relying on personal protective equipment (PPE)," "being busy with catching up with the new guidelines for MERS," and "caring for suspected or infected patients with caution." The themes and quotations are shown in Table 1.

3.1 | Experiencing burnout owing to the heavy workload

3.1.1 | Exhausted because of vigilant monitoring of the person at high risk to break the chain

Participants reported that they experienced burnout over time because of the heavy workload during the MERS outbreak. Checking patients' and visitors' temperatures and the routes they had taken was a big part of the workload for floor nurses. Participants said that the presence of fever was checked at the hospital entrance for all visitors and staff using fever detectors installed at the gate of the hospitals. Additionally, they had to inquire about whether patients had recently taken a trip to the Middle East or had visited a hospital that had a confirmed case of MERS. Staff who worked outside the hospital building to check visitors' temperatures suffered from the heat of hot summer. Furthermore, participants complained of getting off work late because of increased work and short staffing in their nursing units. They stated that some nurses had to move to work at other units, such as temporary quarantine, hospital entrance gates, or airborne isolation rooms. In addition, some nurses were reverse isolated at their home because of the possibility of transmitting the virus to patients. The participants reported experiencing burnout as they faced the deteriorating situation and worked without expecting when this would stop. "It takes more time for admitting patients because of the need to perform additional history taking and providing education related to MERS, including hand washing and wearing a mask."

3.1.2 | Stressed about restricting unauthorized access

Our participants expressed they were tired of restricting families and friends from visiting patients in the hospitals. They pointed out that visiting hospitalized patients and even staying overnight with the

patients in the hospitals should be strictly limited, especially during the outbreak.

3.2 | Relying on personal protective equipment for safety

3.2.1 | Concerns for safety

Most participants reported that they were afraid of becoming infected with MERS-CoV while caring for the patients. They took precautions by wearing PPE. Participants said that they relied on PPE; however, they were still concerned that the PPE might not provide absolute protection. For example, respiratory protection equipment they used ranged from a N95 mask to a powered air purifying respirator (PAPR). Participants who used a N95 mask said, "I am wearing the mask (N95), but I am not sure I am well protected. I don't know if I am wearing it correctly." Meanwhile, other nurses working at the airborne isolation ICU said that they had learned the appropriate way of wearing PPE with a PAPR from an infection control nurse through private or group instruction. Those who had thorough instructions about wearing PPE believed they were protected through their PPE.

3.2.2 | Discomfort of wearing personal protective equipment

Participants reported discomfort in wearing PPE all day on duty. The amount of time of wearing PPE varied according to their work and the severity of the patients' condition. Participants said that they preferred a mask that led to less breathing difficulties. One participant said, "I prefer the mask made by A company because it has a space that helps me to breathe easily. Many nurses prefer to use it."

The patterns of staying in the isolation room wearing a PAPR differed. Nurses from one hospital stated that they stayed in the isolation room for a maximum of 2 hours while wearing their PAPR and then came out; they stayed in the anteroom (a room in front of the negative pressure isolation room) and went back into the isolation room when needed. Contrary to this, nurses from another hospital stayed in the isolation room for their entire shift, except for the lunch hour. Meanwhile, nurses who wore a PAPR said that they felt like wearing a space suit. They had a backache from wearing heavy equipment. "I had put the battery of the PAPR on a side table while sitting down in the room and this helped me a lot."

3.3 | Being busy with catching up with the new guidelines for MERS

3.3.1 | Frequently changing guidelines

As the MERS outbreak continued, the Korea Centers for Disease Control and Prevention released updated guidelines and information regarding MERS for health professionals. The infection control departments in the hospitals posted their new guidelines reflecting the governmental guidelines on their bulletin board. Our participants were sometimes confused and were busy with catching up with frequently changing unclear guidelines. They said, "The guidelines were changed more and more. It was difficult to remain fully aware of it."

3.3.2 | Sharing the new information

Nurses communicated with their colleagues using various channels, such as hospital bulletin boards, verbal and written reports during shift changes on the unit, or *Kakao Talk* (free mobile text system). In particular, *Kakao Talk* was used for sending urgent messages to nurses or for informing them about the frequently changing guidelines. Some nurses said they had to check the *Kakao Talk* messages constantly and were annoyed with the message alarm sounds of *Kakao Talk* when they received them at night. On the other hand, some said, "it (communicating through *Kakao Talk*) was convenient and very useful to share information rapidly."

3.4 | Caring for suspected or infected patients with caution

3.4.1 | Lack of support

Participants said nurses responded differently to volunteering for care of the confirmed patients with MERS. Some did not want to be exposed to high-risk patients and said, "I hope I am not the one chosen." However, a few nurses volunteered to take care of these patients. Some of these nurses received negative feedback and no support from their colleagues. They said they were uncomfortable when they were given disapproving looks or responses from peers, such as "Why? Why does it have to be you?" Similarly, family members' responses to volunteering nurses varied. Some were very supportive, and others were not. Worried family members stated, for example, "Why do you have to do it, and what if you are infected?"

3.4.2 | Identifying the best way to care for patients

Participants who worked in airborne infection isolation rooms said that wearing the PAPR made them difficult to communicate with patients and other nurses in anterooms. They said that it was not easy to communicate with patients on a respirator while wearing PPE as noise from the respirator or other machines and face shields of their PAPR impeded communication. Yet nurses wearing a PAPR used various methods to communicate with patients and other staff. Participants communicated with others by writing on paper. They reported that it was easy to hear the intercom sound in the room, but it was difficult to talk back because the head shield of the PAPR blocked out sounds.

Permission to use computers or smartphones in the isolation room varied across hospitals. In one hospital, nurses working in an isolated intensive unit communicated with other nurses in another isolated room using a smartphone messenger application. They said it helped them to know how others in isolation rooms were doing and to ask them when they were unsure about patient care.

3.4.3 | Going back to routines feeling valued and appreciated

Participants said that they gradually returned to normal life. The hospitals rewarded working with MERS patients differently. These included participating in healing programs, receiving financial incentives, eating out in teams, or receiving several days off for resting. A participant said "I enjoyed participating in the healing camp. The

post-trauma prevention education was also helpful. I was relieved to hear that we could seek psychiatric counselling if necessary."

After completing their volunteered job with the MERS patients, participants stated that they had learned on site while caring for infected patients and that it was very rewarding and worthwhile. They expressed that they felt being matured and gained a lot of confidence from these experiences. Participants also said that when they returned to their work unit, they often heard "You did a good job" from their peers, and that "It felt supportive and healing."

4 | DISCUSSION

This study explored the nurses' work experience during the MERS outbreak. Our participants reported that their workload increased with time. This result indicates that, as part of emergency planning, nurse managers and hospital administrators should prepare for the extra workload during the emergency of an infection outbreak and to ensure quality of care.

Participants reported that restricting unauthorized access of visitors was one of the main issues. Restricting visitors was one of the strategies used for controlling further outbreak during the Norovirus outbreak (Danial et al., 2016). Visiting hospitalized patients in a group is a part of the Korean culture, as it is a way of expressing support and wishing for a quick recovery. Rather than just restricting the visitors, it would be helpful to suggest alternative ways of expressing support for patients, such as sending a message through a phone or social networking service.

Participants expressed their concerns about the possibility of being infected. In fact, health care personnel who had close contact with MERS patients were at a high risk for infection (Alraddadi et al., 2016). Previous studies support our results. During the MERS epidemic, health care workers felt fearful about being infected; however, they continued to work during the epidemic as it was their professional and ethical duty (Al-Dorzi et al., 2016; Khalid, Khalid, Qabajah, Barnard, & Qushmaq, 2016). Emergency room nurses working during the outbreak of MERS also expressed high concerns about being infected, and that they would have like to avoid caring for patients with MERS if there was a choice (Choi & Kim, 2016). These fears of nurses could be reduced by sharing the correct information about the quality of the protection devices they wear and appropriate ways to use them to prevent the transmission of infection (Speroni et al., 2015). In addition, hospitals experiencing MERS epidemic suggested that institutional plans be made in advance to provide personal safety equipment when there is a rapid increase in its demand (Al-Dorzi et al., 2016; Stirling, Hatcher, & Harmston, 2017). However, our participants mentioned discomfort in wearing PPE. Likewise, a study on a simulation exercise for health care workers wearing PPE in a hospital in the UK reported that they found the PPE uncomfortable, and even basic tasks took longer than usual while wearing it (Phin et al., 2009). Thus, feedback from nurses on protection devices would help medical equipment companies design more comfortable medical protection equipment.

Our participants complained of having to continuously catch up with the frequently updated guidelines. Likewise, it was reported that one of challenges for hospitals was the changing and conflicting guidelines and the overwhelming amount of information that required sifting

through during the H1N1 influenza pandemic (Rebmann, 2010). This result supports the notion that when a new infection outbreak occurs, changing the guidelines too frequently could confuse clinicians, making it difficult for them to follow the guidelines. Therefore, hospitals should develop an infectious disease epidemic control plan in advance, which includes standardized care protocols and communication with national health services as previous studies suggested from their own experience during the outbreak (Al-Dorzi et al., 2016; Stirling et al., 2017).

In addition, nurses taking care of MERS-infected patients reported that they had a hard time when they received negative feedback from peers or family members. Choi and Kim (2016) also found that the social stigma for nurse themselves and their families resulting from their work with MERS patients was the most influential factor of ethical problems that nurses experienced during the MERS outbreak. It would be helpful for peers and family members to understand and support nurses who decide to get involved in caring for infected patients. Furthermore, it is necessary to provide the accurate information during the early stage of disease outbreak to lower the level of worry among people, in particular those having a high daily life stress and poor self-rated health status (Ro, Lee, Kang, & Jung, 2017).

During the H1N1 outbreak, nurses caring for infected and high-risk patients reported that they felt lonely in the isolation room (Honey & Wang, 2013). Our result shows that communicating with other nurses using messengers was helpful to support each other and gain information from their colleagues. Nevertheless, our participants stated that their PPE was a barrier to communicate. Interphones between anteroom and isolation room were good to listen to but not to speak while wearing PPE. Hence, effective communication channels should be established for the nurses caring for infected patients during the outbreak to help them get emotional support while working hard in wearing PPE.

Regarding going back to routines, our participants felt supported when they received positive responses from peers when they went back to their unit after taking care of patients at risk. Additionally, hospitals implemented various programs for health care professionals to reward or appreciate their hard work during the outbreak. The common response of participants on these was very positive. In a study, nurses who took care of H1N1 high-risk infected patients and who worked in an isolated area in Taiwan said that nurses needed counselling services (Honey & Wang, 2013). After any outbreak, it may be important to offer a healing program for nurses, to help them share their experiences and feelings with others.

4.1 | Limitations

A limitation of this study was that all participants were staff nurses. Further research is needed to explore the MERS experiences of patients, nurse managers, and other health care workers. Because of variations in nurses' work schedule, the focus groups were quite small. The disadvantage of a small group is that it limits generating a rich diversity in views and the total range of experiences, although the advantage of smaller groups is that they are easier to recruit and allow everyone to have a greater opportunity to share experiences. Another limitation was that this was a cross-sectional study. Longitudinal studies are needed to examine the impact of any changes in hospital regulations or policies on nursing care.

5 | CONCLUSION

These study results suggest that nurse managers and administrative personnel should understand that overload of nurses' work during the outbreak may lead them burned out, which may negatively affect quality of care to patients. Furthermore, establishing consistent and solid practice guidelines and efficiently disseminating them and training health care workers to deliver them could lead to less confusion during an infection outbreak. It is important to acknowledge nurses' work as valuable and to create a supportive environment in workplace of nurses. These efforts will empower nurses to work as an expert and will positively influence the quality of care. Finally, it is essential to raise awareness about infection control among health care workers and people in general to strengthen emergency preparedness.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHORSHIP STATEMENT

All listed authors meet the authorship criteria and all authors are in agreement with the content of the manuscript.

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