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Experiences of nurses in charge of COVID-19 critical care patients during the initial stages of the pandemic in Japan

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Abstract: The fatality rate of the coronavirus disease (COVID-19) at the beginning of the pandemic was as high as 8.5%, and it was considered to be an intractable infectious disease. Reports regarding early experiences are essential for improving nurses' quality of care, patient safety, and working conditions during future pandemics. Therefore, this study aimed to describe the experiences of nurses who were in charge of critically ill COVID-19 patients during the early stages of the pandemic in Japan. This was a qualitative study. Participants were nurses who were in charge of critically ill COVID-19 patients in an emerging contagious disease ward between February and April 2020. Interviews were conducted in groups of 2–3 persons based on an interview guide using an online conferencing application to prevent infection. Consent to participation was obtained from 19 nurses. Five categories of experiences were generated from the analysis: "Fear of risk to my own life and to those of others around me", "The shock of finding myself amid an infectious disease pandemic", "Anxiety about unknown challenges", "Driven by a sense of purpose", and "Growth as nurses". Working under harsh conditions where nurses' safety is threatened may affect the quality of care and nurses' mental health. Therefore, nurses should receive both short-term and long-term support.

***Keywords*:** COVID-19, critical care, nurse, qualitative study, experience

Introduction

The coronavirus disease (COVID-19) is a contagious respiratory disease caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The virus was first identified in Wuhan, China, in December 2019 and quickly spread worldwide; the World Health Organization (WHO) declared it a pandemic on March 11, 2020 (*1*). All continents reported cases of COVID-19, and as of January 15, 2023, the cumulative number of confirmed cases exceeded 662 million and deaths exceeded 6.7 million (*2*). During this period, the number of new infections has increased and then decreased, partly due to the emergence of mutant strains of COVID-19. In addition to managing increased patient loads, health workers have been at the frontlines of exposure to SARS-CoV-2. The WHO estimates that 116,000 health workers died from COVID-19 between January 2020 and May 2021 (*3*).

The fatality rate of COVID-19 at the beginning of the pandemic was as high as 8.5% (*4*), and it was considered to be an incurable infectious disease. In addition, approximately 5% of COVID-19 patients became critically ill, requiring intensive care (*5*). The most common reasons for intensive care admission were acute respiratory distress syndrome and the need for a ventilator (*6*). In the most severe cases, the use of extracorporeal membrane oxygenation (ECMO) was also necessary.

The COVID-19 pandemic posed unprecedented challenges to healthcare systems worldwide (*7*), with Japan bring similarly disrupted. The number of ICU beds in Japan was four per 100,000 people, less than the 7 beds per 100,000 people in Europe and 24 beds per 100,000 people in the United States (*8*). As a result, non-intensive care nurses often had to manage critically ill patients (*9*). Intensive care is considered complex and uncertain even under normal circumstances; however, this complexity and uncertainty further increased during the pandemic. In addition, the physical and psychological burden on nurses caring for patients with COVID-19 has been reported to be high because the interventions required to care for these patients are primarily performed by nurses (*10-19*). Unfortunately, only a few nurses have reported their experiences with severely ill COVID-19 patients in the early days of the COVID-19 pandemic. Reports regarding early experiences are essential to improving nurses' quality

of care, patient safety, and working conditions during future pandemics.

This study aimed to describe the experiences of nurses in charge of critically ill COVID-19 patients during the early stages of the pandemic in Japan.

Materials and Methods

Study design

This study examined nursing practices for patients with emerging infectious diseases. Research in this field is still limited, and potential problems needed to be identified. Therefore, the use of qualitative research methodologies was considered essential to addressing this issue.

Participant selection

The participants were nurses in charge of COVID-19 patients on ECMO in a new infectious disease ward of a designated medical facility for specified infectious diseases in central Tokyo, Japan, from February to April 2020. In Japan, the Ministry of Health, Labour, and Welfare designates certain medical facilities to legally accept patients with signs of new infectious diseases, category one infectious diseases such as Ebola hemorrhagic fever, category two infectious diseases such as Middle East respiratory syndrome (MERS), or infectious diseases such as new strains of influenza. There are only four such hospitals in Japan. A new infectious disease ward is only opened when an outbreak results in an applicable patient's hospitalization. The hospital has received patients with H1N1 influenza, as well as SARS, Ebola, and MERS pseudo-infections. During normal times, new infectious disease nurses are assigned to the wards; once a month, they share information, review manuals, and conduct training to don and doff personal protective equipment (PPE) . In addition, drills are held jointly with the administration and other facilities three times a year to prepare for the acceptance of patients (*20*). From February to March 2000, only 48 COVID-19 patients had ECMO in Japan (*21*). In other words, the study facility received severely ill patients equipped with ECMO in the early stages of the pandemic.

Twenty-three nurses were initially registered in the new infectious disease ward. Six additional nurses from the ICU and other facilities were assigned to work there in response to the COVID-19 pandemic. Of the 29 nurses, one was transferred to another hospital, one retired, and four were this study's researchers. Therefore, 23 eligible participants were contacted to participate in this study by email.

Settings

Data were collected between April and June 2020 in online meetings using Microsoft Teams rather than in person to prevent infection and were in the form of focus group interviews. We chose focus group interviews because of the synergistic nature of the group, the ability to collect more extensive and coherent data than in individual interviews, the fact that group discussions of the topic can be more stimulating, and because a group setting can be more comfortable and promote honest responses (*22*). Each session included 2–3 participants and an interviewer. An interview guide was presented to the participants in advance and included questions such as: "How did you feel when you were in charge of COVID-19 patients?", "How did you feel when caring for patients on ECMO?", and "What were your biggest concerns?". Depending on how the interviews proceeded and the participants' responses, we changed the questions and the order in which they were asked to allow the participants to speak in their own words as much as possible. The interviews were recorded, with the participants' consent.

In addition, to obtain background information on the participants, information regarding age, sex, highest level of education, nursing experience, previous critical care experience were collected on paper before the interviews began.

Researcher characteristics and reflexivity

The interviewers were the authors: UA, BH, and IS. They were nurses working in the same hospital, including those who had worked together in the new infectious disease ward. Therefore, they had established personal relationships with the participants and were in a position to understand the situations they had experienced. The interviewers, one with a Ph.D. and two with MSNs, were all female: one (UA) was a certified nurse specialist in critical care nursing, one (IS) was a certified nurse specialist in infection control nursing, and two (UA and BH) were trained in qualitative research and had previously authored papers. A psychological counselor (MS) joined the analysis to add a multidimensional perspective.

Data analysis

Written transcripts of the recordings were prepared, and qualitative content analysis was performed based on work by Graneheim & Lundman (*23*).

The study was conducted in four steps using MAXQDA Analytic Pro2020 (Release 20.4.2): *i*) The transcripts were read repeatedly in their entirety to grasp the full picture, and the portions representing the research question were extracted as units of record; *ii*) For each unit of record, the meaning was read and expressed in a brief sentence to generate a code; *iii*) Codes were compared, and similar codes were combined to form a subcategory; *iv*) Subcategories were compared,

and similar subcategories were integrated and extracted as categories. The first author, UA, conducted the initial analysis of Steps 1 and 2. MS participated beginning with Step 3.

The Results section presents categories and subcategories, followed by representative narratives.

Rigor and trustworthiness

The results were evaluated using the following four criteria: Credibility, Transferability, Dependability, and Confirmability. Two researchers made decisions regarding coding, analysis, and interpretation. In addition, the transcripts were reviewed by the participants to ensure that their opinions were accurately expressed. Transferability was confirmed by carefully describing context, as knowledge of the nurses' actions and experiences, and their backgrounds, making the given information more meaningful to the reader. Finally, to ensure Dependability and Confirmability, the logic of the research process was documented so that the two co-researchers could track the data and their sources and understand their interpretations (*24*).

Ethical considerations

This study was approved by the Ethics Review Committee of the National Center for Global Health and Medicine (No. 3561). Participants were informed orally and in writing that they were free to participate in the study and to refuse or withdraw from participation, that anonymity would be maintained, and that the data would not be used for any purpose other than research. Consent was obtained in writing. Participants were recruited *via* email to avoid coercion. Interviews were conducted online with ethical considerations regarding infection prevention.

Results

Characteristics of study participants

Of the 23 nurses contacted *via* email, 19 agreed to participate in this study. The demographic data of the participants are shown in Table 1. Seventeen participants were female (89.4%) and two were male (10.6%); two were in their 20s (10.6%), nine were in their 30s (47.3%), seven were in their 40s (36.8%), and one was in her 50s (5.2%); the average years of nursing experience and standard deviation was 15.5 ± 5.4 years; 16 (84.2%) were assistant nurse managers; and nine had critical care experience. A total of eight group interviews were conducted, averaging a length of 81 minutes (60–102 minutes).

Five categories and 12 subcategories were generated regarding the experiences of nurses in charge of critically ill COVID-19 patients during the early stages of the COVID-19 pandemic in Japan. The five categories were: "Fear of risk to my own life and to those of others around me", "The shock of finding myself amid an infectious disease pandemic", "Anxiety about unknown challenges", "Driven by a sense of purpose", and "Growth as a nurse" (Table 2).

Category 1: Fear of risk to my own life and to those around me

This category was generated from the subcategories "Fear of a possible infection" and "Fear of becoming a source of infection myself". All of the participants talked about their fear of becoming infected at any moment.

Fear of a possible infection

During the early stages of the COVID-19 pandemic, participants provided care without evidence. In addition, we were working amid daily news reports of many deaths worldwide. All participants spoke of their fear of infection. The following is a representative narrative.

"I still fear that there is no established treatment for COVID-19, that the probability of infection has yet to be determined, and that if I were to transfer, I would actually end up in such a situation like the person in front of me....." – (N)

"At first, there was much discussion about whether COVID-19 was airborne or not. There were some aspects in which this was true. In addition, I had yet to learn how long the virus would take to lose its infectivity once it had taken hold. I had no idea how long the virus would take to lose its infectivity, so that was a little scary. Unknown infections are different from the usual." – (K)

Fear of becoming a source of infection myself

Table 1. Participants' demographic data

Characteristics	*n* (%)	Mean (SD)
Gender[*a]		
Female	17 (89.4)	
Male	2 (10.6)	
Age		
20–29	2 (10.6)	
30–39	9 (47.3)	
40–49	7 (36.8)	
50–59	1 (5.2)	
Nursing experience (years)		15.5 (5.4)
Critical care experience (years)[*b]		4.0 (21.1)
Job title		
Registered nurse	3 (15.8)	
Assistant head nurse	16 (84.2)	
Highest Level of Education		
Master's	1 (5.2)	
Bachelor	10 (52.6)	
Junior college	1 (5.2)	
Vocational school	7 (36.8)	

[*a]Gender: Female: A, B, C, D, E, F, G, I, J, K, L, M, N, O, P, Q, S; Male: H, R. [*b]Have experience in critical care: Yes: B, C, G, H, I, J, P, Q, R; No: D, E, F, K, M, N, O, S.

Table 2. Categories, subcategories, and codes generated based on analysis of the data

Category	Subcategory	Code
Fear of risk to my own life and to those around me	Fear of a possible infection	Fear of becoming severely ill like the patient I am caring for
		Fear of getting infected
		Doubts regarding infection prevention measures
		Fear of the unknown virus
		Fear of facing a PPE shortage
		People around me worrying about me
		Fear of becoming a source of infection yourself
		Anxiety about infecting my children
		Restricting my children's activities to prevent the spread of infection
	Fear of becoming a source of infection myself	Fear of becoming a source of infection myself
		Anxiety about infecting my children
		Restricting my children's activities to prevent the spread of infection
The shock of finding myself amid an infectious disease pandemic	The shock of isolation at the end of life	The shock associated with a lonely death
		Frustration with visitation restrictions
	Extreme exhaustion and harsh working conditions	Doing strenuous work while wearing protective clothing
		Extreme exhaustion
		Significant damage to mental health
	Fear of discrimination	Fear of falling out of favor with those around me due to caring for COVID-19 patients
		Fear of being discriminated against
Anxiety about unknown challenges	Anxiety about caring for critical patients	Unfamiliar life-support equipment
		Fear of being unable to respond in an eventuality
		Fear of not being able to save a patient
		Insecurity of whether or not I can perform my duties
		Fear arising from a lack of experience in nursing severely ill patients
		Tension of being in an isolated space
	Impromptu team building	Difficulty in impromptu team building
		Frustration with not being able to work proactively in a team
Driven by a sense of purpose	Driven by a sense of purpose	In "battle mode"
		The day I am finally called upon
	Striving to fulfill my nursing duties	Considering every patient's individual personality as much as possible, even under difficult conditions
		Incorporating everyday elements into the treatment space
	Motivating myself	Considering the pandemic as an opportunity to put my experience to use
		Having a strong will
		Having a positive attitude to hold myself together
		Utilizing previous earthquake-related experience
	Seeking something trustworthy	Trusting in the infection control team
		Examining the flood of incoming information
		Checking my own physical condition
		Continuously trusting basic techniques
		The self-confidence developed through training
Growth as a nurse	Growth as a nurse	Using this experience to propel my career
		Opportune time to learn from other nurses
		Feeling the excitement of working in intensive care

Participants feared becoming infected. They also feared infecting others around them.

"This is a story about family relations. When I was working in the new infectious disease ward, the entire time I was working there, my father was nearly dying. After everything, he passed away in early April. I couldn't see my father, who was near death, because I felt that I might pass on the virus. I didn't want to be the one to infect him further and become the final blow. I couldn't go home." – (G)

Category 2: The shock of finding myself amid an infectious disease pandemic

This category consisted of three subcategories: "The shock of isolation at the end of life", "Extreme exhaustion and harsh working conditions", and "Fear of discrimination". Due to the pandemic, nurses were shocked to face situations that they would not usually experience in the healthcare field.

The shock of isolation at the end of life

Family members were not allowed to visit for fear of spreading infection. Such meetings occurred exclusively online. One nurse caring for a dying patient was profoundly shocked by how the patient died. His passing was outside of her normal experience.

"The last part is already too sad. That is a special white bag.... I forgot its name, but it was a cadaver bag. I don't remember the name, but it was a special white

cadaver bag. When I saw him coming back in that bag, it really showed me the cruelty... It was so sad to see him being sent off like this. It really brought tears to my eyes. I dwelled on that event for a while." – (I)

Extreme exhaustion and harsh working conditions

The long working hours, involving delicate work in protective clothing, were extremely physically and mentally demanding.

"I have big ears, and because of that, my N95 mask slips off. The N95 mask and the face shield would slide out of place. It was really stressful, and I had pressure sores in my ears." – (F)

"It was very stressful, you know. I had a strange feeling that I would get an itch when I entered the infected room or that my mask was somehow slipping off. It's a strange experience. The stress must have dulled my senses." – (P)

Fear of discrimination

The pandemic also presented phenomena that nurses usually do not need to confront. Most participants were dedicated to providing direct patient care but were concerned about their everyday conditions.

"I see a lot of discrimination against medical personnel on TV... I think it's probably okay. I don't want people to think that way about me. I didn't dare to talk about it, so I didn't tell anyone." – (H)

Category 3: Anxiety about unknown challenges

This category consisted of two subcategories: " Anxiety about caring for critical patients" and "Impromptu team building". Because of the pandemic, a mixed team of nurses whose typical duties did not include critical care was assigned to care for the most severely ill patients with COVID-19 who received ECMO.

Anxiety about caring for critical patients

Because of the pandemic, some participants performed duties outside their typical responsibilities in situations they had not previously experienced.

"I had never seen ECMO itself, so it was scary and incomprehensible!" – (O)

"My experience in critical care, such as in the HCU and ICU, was insufficient. I had no experience with critical care. I was afraid of being unable to imagine how I would care for patients." – (M)

Impromptu team building

Because of the pandemic, participants formed impromptu teams consisting of members with whom they did not work daily, such as doctors, clinical engineers, and nurses. They then had to perform at their best to save patients. In addition, participants felt daunted by taking on new challenges in an unfamiliar setting and with unknown members.

"I had to work in a situation where trust had yet to be established, and the other staff had no idea to what extent I could handle the situation. I reported closely to them as if I were a new nurse. I consciously made it a point to inform others of my situation." – (K)

Category 4: Driven by a sense of purpose

This category consisted of four subcategories: "Driven by a sense of purpose", "Striving to fulfill my nursing duties", "Motivating myself", and "Seeking something trustworthy". None of the participants refused to perform their duties under difficult circumstances. Many nurses described motivations that prompted them to do so.

Driven by a sense of purpose

The participants were nurses managing a new infectious disease ward at a specified medical facility for infectious diseases. Therefore, they knew their roles when a new patient with a contagious disease was admitted.

"When the call came, I knew that I had been training daily and was a team member. I felt like my time had come. I felt like I was finally arriving." – (E)

Striving to fulfill my nursing duties

The participants tried to fulfill their nursing responsibilities, even in a specialized and unfamiliar environment.

"It is a world without sound, isn't it?" Particularly in an infectious disease ward, the ward is closed off. Without the sound of alarms around you, it is just the sound of the ventilator and ECMO running. And the ECMO is under negative pressure, so there is always the sound of the machine's fan.

"I thought that it might be nice to hear some voices, I thought it would be nice to have a place where people could experience their daily lives in such an unusual setting, even if it was just the sound of people talking to someone." – (P)

Motivating myself

Despite the harsh and unsafe working conditions, the participants were able to push themselves to fulfill their responsibilities as nurses.

"I still wonder if I'm infected, if I'm going to die, or if I'm going to get something worse. I think we talked about not thinking about such things. We were all in the break room together, and I thought it was like a folk remedy, that I would not get infected. Of course, I strongly felt I would not get infected." – (Q)

Seeking something trustworthy

In an uncertain world, participants sought any reliable information they could find.

"The Internet was at the center. But so much

information was being broadcast not only on the Internet but also on TV. Whenever I looked at the information, I still could not determine which information was correct and which leads the medical community needed to believe. But I was afraid to shut out the information....." – (R)

Category 5: Growth as a nurse

Some participants who completed their mission to provide direct care to COVID-19 patients said that the experience was both a hardship and an opportunity for them to grow as nurses.

"Working with the ICU staff taught me many things, and I realized that I could not care for patients because I feared them. I don't think I have much perspective, but I learned a lot. So, it was a valuable experience, and I think it was a valuable experience for me to have." – (K)

Discussion

Results indicated that caring for critically ill patients in the early stages of the COVID-19 pandemic was a very difficult mission under physically and emotionally stressful conditions. However, results also indicated that the nurses were highly motivated to care for patients even under such conditions. The participants in this study were characterized by two features. First, they were assigned to COVID-19 critical patients in the early phase of the disease, before the WHO declared it a pandemic. Second, they were nurses working in and who had roles in a designated medical facility for specified and emerging infectious diseases.

Duty under challenging conditions

The surveyed nurses were routinely prepared for infectious diseases. However, the most frequently mentioned fear was still that they might become infected or become vectors and transmit the infection to others around them. Many previous studies have also noted the same fear of the disease (*10-12,25*). This study supports the findings of previous studies, which reported that 90% of nurses who worked with COVID-19 were concerned about spreading COVID-19 to family members (*26*), 30% were afraid to go to work because of inadequate protection and risk of infection, and 40% were afraid to care for patients (*27*). Infectious disease care is a health risk that is not only associated with the healthcare provider themselves but also with the patient's health. Therefore, infectious disease care is a mission under conditions where healthcare providers and their families may become infected. Even nurses with previous roles and training in handling emerging infectious diseases still feared unknown diseases. They spoke of their readiness to undertake the mission as if they were going into battle.

In addition, as noted in previous studies (*11,13,28-30*), long working hours with unfamiliar colleagues and in an unfamiliar environment while wearing PPE took a heavy toll on the nurses physically and mentally. Crowe & Howard (*13*) found that 38% of nurses who cared for COVID-19 patients reported severe symptoms of PTSD, 57% reported severe depression, 67% reported anxiety, and 54% reported stress, suggesting that the nurses in this study were also under significant psychological strain and pressure.

In addition to fear of possible infection, many spoke of the fear of discrimination by society. For example, in a previous study, 30% of nurses working on the frontlines during the COVID-19 pandemic reported being threatened or harassed (*31*). This study also revealed concerns regarding societal stigma.

Motivation

Despite the challenging circumstances, none of the nurses in this study refused to perform their duties. Moreover, the nurses were motivated by a sense of mission and strove to fulfill their nursing duties. Despite the uncertainty of the situation, each was searching for something to believe in and keep themselves going, similar to the findings of previous studies in which nurses remained in the workplace despite their fear and vulnerability (*32*), they shouldered the greater risk of infection to their families and themselves, and they remained steadfast in their commitment to care for their patients (*33,34*). Nurses' deep desire to provide quality and proper care (*35*) has been emphasized in professional ethics. This influence was reflected in the results of this survey. Most participants talked about their trust in their organizations. Because they were working during the early stages of the pandemic, little reliable evidence was available, and a variety of information flowed from the media. While daily reports of many deaths in foreign countries increased tension, most said that they trusted the information provided by the infection control team of the hospital where they worked, whose mission was to address infectious diseases. Providing nurses with reliable information is crucial to reducing their psychological burden. A previous study has suggested that providing nurses with adequate information and resources to protect themselves may help alleviate the fear associated with infection (*26*).

In addition, the participants were nurses whose responsibilities included responding to emerging infectious diseases, so they regularly received training in infectious diseases, giving them confidence in their responses. Therefore, training to prepare for contingencies is still necessary.

Growth as nurses

Despite the challenging situation and negative emotions,

such as a sense of burden, the nurses also had positive feelings, remarking that they were able to grow through experiences they could only have had in this situation.

These findings corroborate previous studies which found that nurses, despite the difficulties during the COVID-19 pandemic, were happy (*36*) and had positive feelings (*17*), saying that they were able to experience things that they could only experience in such a situation.

This situation is not unique to COVID-19; nurses who dealt with MERS patients reported overcoming extreme situations with the feeling that they were growing as nurses and were more robust than before (*37*).

Post-traumatic growth (PTG) is a "positive psychological change in the aftermath of a traumatic event" (*38*). Many professions whose primary job is to protect human life, such as police, fire, and first responders, have reported learning how a traumatic event can lead to growth. However, fear is undoubtedly also present (*39*,*40*). One study claims that it is low (*38*). Most studies use a timeline of months to years, and the consensus view is that growth occurs only after coping and psychological struggle (*38*). However, the development process still needs to be explored in-depth. A limited number of studies (*41-43*) examining PTG related to COVID-19 examined the changes in PTG scale scores. The nurses in the current study were able to recognize their own stress, but whether they had reached the point of experiencing PTG remains unclear. In retrospect, the pandemic had just begun during the survey, and a strong sense of social uncertainty existed. Therefore, we can surmise that many participants may not have reached the point of PTG.

Creating a supportive environment, providing rewards, encouraging self-disclosure and intentional ruminations, and supporting the discovery and pursuit of life's meaning (*44*) were necessary for PTG for the nurses who took on enough challenges to experience it.

Limitations

This survey was conducted with nurses who were routinely responsible for responding to emerging infectious diseases in a medical facility in Japan. The facility was designated to handle these specified infectious diseases. Accordingly, we should be cautious about generalizing the results. However, their experiences are still similar to those of nurses who responded to the needs of COVID-19 patients worldwide, as reported in previous studies. Therefore, we believe that this study's findings will be useful during future emerging infectious disease pandemics.

In addition, this study was completed during the early stages of the COVID-19 pandemic, so the interviews were conducted when confusion prevailed regarding circumstances overseas. To prevent infection, we conducted the interviews online. However, online meetings were not common at the time. Therefore, the interview setting may have been unfamiliar to the participants. Moreover, COVID-19 is ongoing, so participants may still be processing their experiences. The limitations of this study are that the interviews were conducted in the early stages of the pandemic when social uncertainty was substantial. Moreover, its design was short-term and retrospective. Therefore, nurses' PTG or their recovery could not be ascertained.

Conclusion

Results indicated that working during a pandemic has severe consequences for nurses. Working under harsh conditions while their own safety is threatened may affect the quality of care they provide. It may also affect nurses' mental health. Therefore, nurses should receive both short-term and long-term support to help mitigate these concerns.

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