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Family caregivers' responses to a visitation restriction policy at a Korean surgical intensive care unit before and during the coronavirus disease 2019 pandemic

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ABSTRACT

Background: Since the COVID-19 pandemic, restricting family visits in the ICU has increased concerns regarding negative psychosocial consequences to patients and families.

Objectives: To compare the quality of life, depressive symptoms, and emotions in family caregivers of ICU patients before and during the COVID-19 pandemic, and to explore families' perceptions and suggestions for the visitation.

Methods: A cross-sectional descriptive survey was conducted in 99 family caregivers of adult surgical ICU patients from an urban academic medical center in South Korea (February to July 2021). The WHO's Quality of Life-BREF, Center for Epidemiologic Studies Depression, and Visual Analogue Scale were used to assess quality of life, depressive symptoms, and emotions, respectively. The Family Perception Checklist was used to assess families' perceptions and suggestions about the visitation restriction. Results were compared with the data from our previous survey ($n = 187$) in 2017.

Results: Family caregivers were mostly women ($n = 59$), adult children ($n = 43$) or spouse ($n = 38$) of patients with mean age of 47.34 years. Family caregivers surveyed during the pandemic reported worsening sadness (54.66 ± 28.93 , 45.58 ± 29.44 , $P = 0.005$) and anxiety (53.86 ± 30.07 , 43.22 ± 29.02 , $P = 0.001$) than those who were surveyed in. While majority of families were satisfied with the visitation restrictions (86.9%), only 50.5% were satisfied with the amount of information provided on the patient's condition.

Conclusions: Visitation restriction is necessary during the COVID-19 pandemic despite sadness and anxiety reported in caregivers. Hence, alternative visitation strategies are needed to mitigate psychological distress and provide sufficient information to ICU family caregivers.

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Introduction

Worldwide, the coronavirus disease 2019 (COVID-19) pandemic has altered hospital care dramatically. Restricting the number of visitors and visiting periods was one of the main recommendations from the World Health Organization (WHO).¹ In particular, these restrictions challenged the intensive care unit (ICU) health care teams to

revisit their existing policies, which had less rigid ICU visitation rules and allowed family involvement in care.² Until the declaration of the COVID-19 pandemic, 'flexible family visits' had been an emerging trend, and efforts were being implemented to remove barriers.³ Its effect on outcomes for patients (e.g., reducing delirium and anxiety)⁴ and family caregivers (e.g., better satisfaction⁵ and reducing anxiety and stress⁶) were being investigated. Since the start of the COVID-19 pandemic, many ICUs have restricted visitors' access⁷ with the main purpose of preventing the spread of life-threatening infections and optimizing the allocation of limited resources, including personal protective equipment. However, continuing this well-meaning restriction became a matter of concern due to its negative consequences for all stakeholders, such as emotional distress and delirium in patients,⁸ physical and psychological distress to family caregivers,⁹ and decision burden and moral distress in ICU clinicians.¹⁰

Abbreviations: COVID-19, Coronavirus disease 2019; ICU, Intensive Care Unit; WHO, World Health Organization; KSCCM, Korean Society of Critical Care Medicine; SICU, Surgical Intensive Care Unit; WHOQOL-BREF, World Health Organization's Quality of Life abbreviated version; CES-D, Center for Epidemiologic Studies -Depression; VAS, Visual Analogue Scale

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In South Korea, contrary to the international trend, most hospitals maintained rigid ICU visitation policies before the COVID-19 era. According to a report by the Korean Society of Critical Care Medicine that surveyed 253 ICU physicians nationwide between June and July 2019 concerning the operation of the 51 ICUs that they worked in, most ICUs limited the number of visits by patients' families to once or twice a day, and the duration of each visit to approximately 30 min to one hour.¹¹

Since February 2020, family visitation has been completely banned in most ICUs in South Korea, including our institution. While studies have examined how current family engagement efforts has been changed since COVID-19 pandemic¹² and effects of visitation restriction on delirium and anxiety among the ICU patients,¹³ little is known about the quality of life, emotions, and perceptions toward the visitation policies among ICU family caregivers since the start of the COVID-19 pandemic in South Korea. In South Korea, flexible and open visitation was not a norm in ICU settings, which was different from other countries where family visits were more flexible and for longer durations. For example, in France¹⁴ and the UK,¹⁵ during the pre-pandemic period, approximately 20% of the ICUs imposed a limit on visiting hours, and the average duration of a visit was four hours.

Considering the low likelihood of returning to pre-pandemic era practices and the uncertain course of COVID-19, ICU health care professionals need to identify the current challenges and perceptions of family caregivers of ICU patients to improve their practices. In 2017, our team examined the quality of life and emotional state of family caregivers of surgical ICU patients and found that the emotional distress of these families was profound.¹⁶ With the growing concern about its adverse effects on mental health across the world, including in South Korea,^{17,18} we hypothesized that family members of critically ill patients may experience a worse emotional state and quality of life due to the restriction of interaction and support to their loved ones in the ICU. Therefore, this study aimed to compare the quality of life, depressive symptoms, and emotional state of family caregivers of critically ill surgical ICU patients before and during the COVID-19 pandemic and explore the family caregivers' perceptions and suggestions regarding the current visitor restriction policies.

Methods

Study design and participants

In this descriptive study, we conducted a cross-sectional survey of the family caregivers of adult surgical ICU (SICU) patients from February to July 2021. To compare the family caregivers' current responses from those before the COVID-19 pandemic, we used the data obtained from our previous study conducted in the same setting with 187 family caregivers from January to July 2017.¹⁶ We defined a family caregiver (hereinafter "caregiver") as a person who provided the majority of the physical, emotional, and/or financial support to the patient. The caregivers were not required to have a legal relationship or to co-habit with the patient prior to their ICU admission. In both surveys in 2021 and 2017, the caregivers were eligible if they were aged ≥ 19 years and had a family member who had been admitted to the SICU.

Setting and data collection procedure

Participant recruitment and data collection were conducted in a SICU of a tertiary academic medical center located in a metropolitan city in South Korea. This 14-bed SICU setting admits patients who need intensive post-surgical care. The nurse-to-patient ratio is 1:1 or 1:2 depending on the severity of the patient's condition. Before the start of the COVID-19 pandemic, family members were allowed to visit up to twice a day (at noon and 6 pm) for 20 min per visit. The family members were able to touch and talk to the patient and

provide mealtime assistance if the patient was able to eat. During the visit, there was an opportunity to discuss the treatment plan directly with the attending physician. However, since the start of the COVID-19 pandemic, while there was no change in the staffing and the scope of clinical service, all in-person visits were banned except for end-of-life cases. Meetings between physicians and caregivers were allowed either in person in the waiting room or via telephone. Video calls between the patient and the families were allowed only in cases where there was prolonged ICU admission lasting longer than a month.

For participant recruitment, study flyers were placed in the ICU family waiting areas. A trained researcher who was a part of the ICU team screened potential participants, explained the study, and obtained their informed consent. Subsequently, the participants self-administered the paper and pencil survey. Provision of informed consent and responses to the survey was done in a private conference room located in the SICU. If there was more than one family caregiver for a patient, we enrolled all of them, as long as they met the eligibility criteria and agreed to participate in the study.

Ethics

The study protocol was reviewed and approved by our Institutional Review Board (4–2020–1460). All the participants provided written informed consent prior to the collection of the data.

Measures

The *World Health Organization's Quality of Life-BREF (WHOQOL-BREF, 26 items)* survey was used to measure the quality of life. This questionnaire comprised four domains: physical health, psychological health, social relationships, and environment. The participants were asked to rate themselves on a 5-point Likert-type scale (from 1 = "not at all" to 5 = "extremely"). The scores for each domain ranged from 4 to 20. The total scores ranged from 26 to 130 with a higher score indicating a better quality of life. We used a Korean version of the WHOQOL-BREF that was translated and validated by Min et al. (2022).¹⁹

The *Center for Epidemiologic Studies Depression Scale (CES-D, 20 items)*²⁰ was used to screen for depressive symptoms. Using a 4-point Likert-type scale (from 0 = "Rarely" to 3 = "Most or all of the time"), the participants were asked to rate how often during the preceding week they had felt in the way presented in each item. Herein, we used the CES-D Korean version.²¹ The total score ranged from 0 to 60 with higher scores indicating worse depressive symptoms. Scores >16 have been used as a cut-off to indicate clinically significant depressive symptoms.²²

The *Visual Analog Scale (VAS) 100 mm* was used to evaluate five basic emotions including happiness, sadness, anger, anxiety, and comfort, subjectively. The VAS has been used as a simple tool to measure subjective emotions²³ by drawing a 100-mm line and a line closer to the patient's emotion. Several studies have demonstrated its validity²⁴ in the measurement of patient anxiety and suggested it as a quick and easy way of identifying patients' emotions.²⁵ The VAS was also used in assessing the emotions of caregivers, for example in caregivers of older adults with Alzheimer's disease.²⁶

The *Family perception checklist (9 items)*, an investigator-developed survey, was used to assess the caregivers' preferences, perceptions, and suggestions about the ongoing visitation restriction policy since the start of the COVID-19 pandemic. The questionnaire consisted of three parts. In the first part on the caregivers' preference (one item), caregivers were asked to choose "yes" or "no" depending on whether they agreed with the visitation restriction policies or not and then to choose the corresponding reasons for their response. The second part consisted of seven items that sought the caregivers' perceptions of the visitation restriction. A 5-point Likert-type scale (from

1 = “strongly disagree” to 5 = “strongly agree”) was used to rate the extent of agreement or disagreement with five statements regarding the visitation restriction during the COVID-19 pandemic (e.g. “Restricting family visitation to ICU is necessary to prevent critically ill patients from the COVID-19 virus”). In two additional items, caregivers were asked to check item(s) that corresponded to the negative effects of visitor restriction on caregivers and patients. The last part on caregivers’ suggestions consisted of one item with a list of possible strategies (e.g., “offer regular face-to-face meetings with ICU clinicians”), and the family caregivers were asked to check one or more items that may help reduce the negative effects of visitor restriction.

Data analysis

A trained research team member entered the data into the IBM SPSS v.22.0 software for Windows. Continuous data were presented as means and SDs. Categorical data were presented as frequencies and percentages. An independent sample *t*-test was used to compare the scores of the measures of the quality of life (WHOQOL-BREF), depressive symptoms (CES-D), and emotions (VAS) between the caregivers who were surveyed in 2021 and those in 2017. A two-tailed *p* value < 0.05 was considered to be statistically significant.

Results

Sample characteristics

From February to July 2021, a total of 108 caregivers were screened and invited to participate in the survey. Four caregivers refused to participate for reasons such as “no interest” “too much stress,” and “the survey seems too long to respond to.” Among the 104 caregivers who consented to participate, 99 completed the survey.

The mean age was 47.34 years with most being women ($n = 59$, 59.5%). The caregivers comprised spouses, 38.3% ($n = 38$), and adult children of the patients, 43.4% ($n = 43$). Table 1 summarizes the characteristics of the caregivers and patients in the period before (2017) and during the COVID-19 pandemic (2021). In the 2017 survey, 11 cases involved participation of two caregivers while one case involved two caregivers in the 2021 survey. Between these periods, while the patients’ ICU admission diagnoses and severity of illness were similar, several characteristics showed significant differences. Both the caregivers and patients were significantly younger in 2021 ($P = 0.043$, $P < 0.0001$, respectively). The hours on mechanical ventilation as well as the length of ICU stay in 2021, were significantly longer compared with those in 2017 ($P < 0.0001$, $P = 0.011$, respectively). In addition, the number of patients admitted to the ICU due to sepsis increased significantly in 2021 ($n = 7$, 7.1%) compared to 2017 ($n = 3$, 1.6%) ($P = 0.022$).

Quality of life, depressive symptoms, and emotional state

Table 2 shows the WHOQOL-BREF scores, CES-D scores, and emotional states according to the time period. With regard to their emotional state, the caregivers surveyed in 2021 reported significantly worse scores in sadness ($P = 0.005$) and anxiety ($P = 0.001$) than the caregivers surveyed in 2017. There was no significant difference in the mean WHOQOL-BREF and CES-D scores in the caregivers between two periods.

Family perception checklist

Caregivers’ preferences regarding the visitation restriction policy

Among the 99 caregivers who responded to our survey in 2021, 84 (84.8%) agreed with the visiting restriction policy. When the caregivers were asked why they agreed to it, the majority ($n = 76$) of the

Table 1
Participants characteristics between the study periods.

Characteristic	Study periods		P-value
	Before COVID-19 (2017) N = 187 No. of patients = 176 [†]	During COVID-19 (2021) N = 99 No. of patients = 98 ^{††}	
Caregivers			
Age, years	51.16 ± 14.00	47.34 ± 13.88	0.043*
Sex			
Male	69 (36.9%)	40 (40.4%)	0.609
Female	118 (63.1%)	59 (59.6%)	
Relationship to patient			
Spouse or significant other	83 (44.4%)	38 (38.4%)	0.379
Non-Spouse	104 (55.6%)	61 (61.6%)	
Patients			
Age, years	65.26 ± 13.44	57.49 ± 15.28	0.000***
Sex			
Male	116 (62.0%)	60 (60.6%)	0.900
Female	71 (38.0%)	39 (39.4%)	
ICU admission diagnosis, n (%)			
Surgery	178 (95.2%)	88 (88.9%)	0.054
Non-surgical issue	9 (4.8%)	11 (11.1%)	
Duration since onset, months	28.64 ± 73.98	25.03 ± 39.99	0.847
APACHE II score (0–75)	17.65 ± 7.18	17.02 ± 7.67	0.539
Hours of mechanical ventilation (Hrs)	15.98 ± 44.81	32.15 ± 56.58	0.000***
ICU length of stay, days	2.88 ± 2.08	3.64 ± 3.25	0.011*

ICU: intensive care unit; APACHE II: Acute Physiology and Chronic Health Evaluation. Data presented as $M \pm SD$ unless otherwise indicated. * $P < 0.05$. ** $P < 0.01$. *** $P < 0.001$.

[†] In 11 cases, two caregivers participated in the survey.

^{††} In one case, two caregivers participated in the study.

responses were “to reduce the risk of infection in the patient”, followed by “to reduce risks of infection in medical staff” ($n = 15$), “to reduce risks of infection in other patients ($n = 11$),” and “to reduce risks of infection in the caregiver ($n = 6$).” Two caregivers reported that they agreed with the visiting restrictions to reduce the cost of infection control. Of the 15 caregivers (16.2%) who disagreed, the decrease in communication between patients and caregivers was the most common reason ($n = 11$). Other reasons for disagreement were the adverse effects on the emotions of patients and caregivers themselves ($n = 8$), reduced communication with the medical staff ($n = 2$), and adverse effects on the patient’s physical function ($n = 1$). One caregiver added a narrative comment saying, “I am not sure whether this visitation restriction can prevent the spread of COVID-19 virus.”

Caregivers’ perceptions regarding the visitation restriction policy

With regard to the caregivers’ perceptions of the visitation restriction policy, their response to each statement is illustrated in Fig. 1. A vast majority of the caregivers strongly agreed or agreed that the visitation restriction was necessary to prevent the spread of the COVID-19 disease to the patient ($n = 87$, 87.9%), caregivers ($n = 77$, 77.8%) and/or ICU clinicians ($n = 85$, 85.8%). While a majority of the caregivers were satisfied with the amount of information on the reasons for the visitation restrictions ($n = 86$, 86.9%), only approximately half of the caregivers were very satisfied or satisfied with the amount of information they were provided on the patient’s condition ($n = 50$, 50.5%). With regard to the negative effects of the visitation restriction policy on patients, the caregivers checked mainly the items relevant to negative emotions such as sadness ($n = 80$), anger ($n = 50$), anxiety ($n = 36$), depression ($n = 27$), guilt ($n = 4$), and insomnia ($n = 2$). Additional concerns to patients were pain ($n = 8$), disrupted relationships with caregivers ($n = 8$), reduced physical activity ($n = 7$), reduced

Table 2

Comparison of the quality of life, depressive symptom, and emotional states in caregivers of the critically ill surgical ICU patients before and during the COVID-19 pandemic.

Variable (Measure)	Before COVID-19 (2017) (N = 187)	During COVID-19 (2021) (N = 99)	P-value
	M ± SD	M ± SD	
Emotional state (Visual Analogue Scale)			
Happiness	51.82 ± 25.04	45.94 ± 24.31	0.122
Sadness	45.58 ± 29.44	54.66 ± 28.93	0.005**
Anger	38.03 ± 26.44	36.05 ± 25.62	0.531
Anxiety	43.22 ± 29.02	53.86 ± 30.07	0.001**
Comfort	46.50 ± 26.09	39.33 ± 26.29	0.078
Quality of life (WHOQOL-BREF)			
Total score	88.17 ± 15.17	88.88 ± 13.17	0.516
Physical	14.16 ± 2.63	13.98 ± 2.43	0.702
Psychological	13.88 ± 2.74	14.08 ± 2.19	0.572
Social	13.27 ± 2.93	13.44 ± 2.76	0.367
Environmental	13.16 ± 2.71	13.42 ± 2.30	0.359
Depressive symptom (CES-D)	16.83 ± 10.73	15.37 ± 11.58	0.112
CES-D > 16	84 (44.9%)	37 (37.4%)	0.258

WHOQOL-BREF: World Health Organization's Quality of Life scale abbreviated version; CES-D: Center for Epidemiologic Studies Depression Scale.

*P < 0.05. **P < 0.01. ***P < 0.001.

quality of life ($n = 6$), and loss of independence ($n = 5$). With regard to the negative effects of the visitation restriction policy on the caregivers themselves, the caregivers checked emotional effects such as sadness ($n = 75$), depression ($n = 30$), anger ($n = 25$), anxiety ($n = 25$), and guilt ($n = 3$). They were also concerned about their reduced quality of life ($n = 22$), pain ($n = 15$), disrupted relationship with the patient ($n = 13$), and loss of independence ($n = 4$).

Caregivers' suggestions regarding the visitation restriction policies

Table 3 is a summary of the frequencies for each response option that the caregivers provided to improve the current visitation policy. The three most frequently selected suggestions were “regular meetings with medical staff ($n = 58$),” “facilitating contact with the

Table 3

Suggestions for improving the current visiting policy.

	n
Regular face-to-face meeting with ICU physicians	58
Activating contact with patient via an alternate method (e.g., online)	52
Providing detailed orientation on visitation policy upon ICU admission	34
Regular meeting with ICU physicians via an alternate contact method (e.g., online)	31
Psychiatric intervention for patients (e.g., counseling, medication)	8
COVID test of all caregivers	6
COVID test of all medical staffs	4
COVID test of all patients	3
Etc.*	3
Psychiatric intervention for caregivers (e.g., counseling, medication)	2

* Etc.: Allow face-to-face meeting for people whose COVID-19 test results are negative.

patients using alternate methods (e.g., online, $n = 52$),” and “provision of a detailed orientation on their visitation policy upon ICU admission ($n = 34$).”

Discussion

During the COVID-19 pandemic, restrictions on family visits to inpatients have been implemented globally to minimize virus transmission and for better allocation of limited resources. In ICU settings, the restriction of physical contact between patients and family caregivers has contradicted the decades of efforts of promoting family-centered critical care,²⁷ which encourages increased physical presence and engagement of family caregivers as care partners. Although this restriction is a public health imperative, clinicians and researchers need to understand the experiences and needs of the caregivers and implement alternative strategies that can support patients and caregivers.

In the present study, we explored depressive symptoms, quality of life, and other emotions and perceptions on visitation restrictions during the COVID-19 pandemic in the caregivers of patients recruited from the SICU of an urban academic medical center in South Korea. Under the current visitation restriction policy, sadness and anxiety were significantly worse in the caregivers compared with their responses in the same setting during the pre-COVID-19 period, when

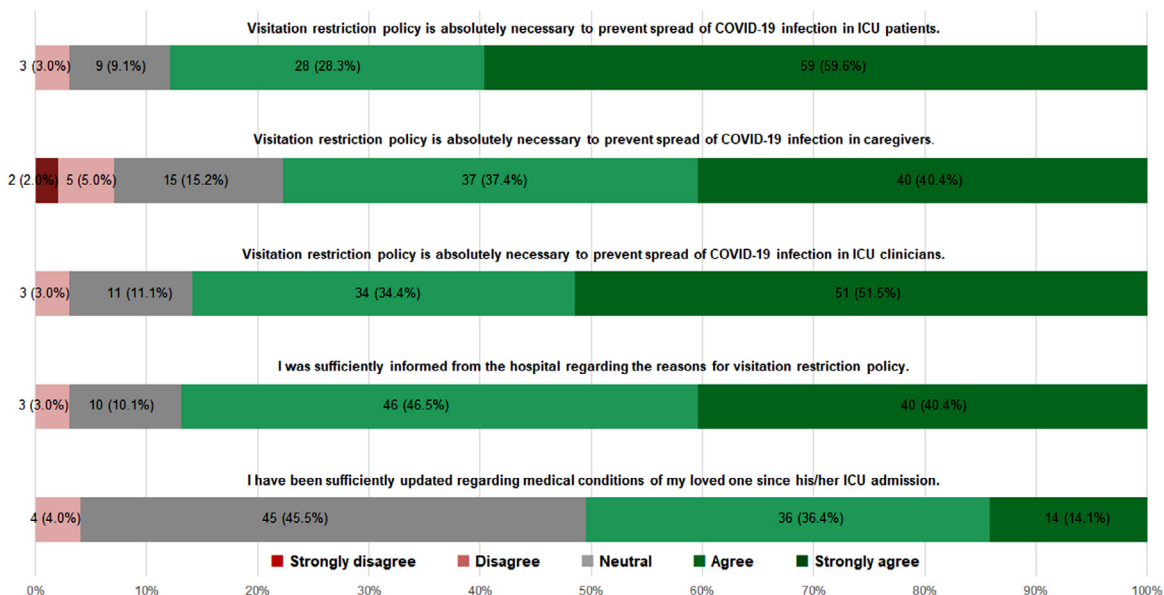


Fig. 1. Caregivers' perceptions regarding the visitation restriction policy.

family visitations were permitted at least twice a day. In our survey, the majority of caregivers agreed that the current visitation restriction was necessary to protect all the stakeholders in the ICU settings (i.e., the patients, clinicians, and caregivers). However, only half of the caregivers agreed that they were sufficiently updated regarding their loved ones' medical conditions. The caregivers reported concerns on the emotional toll that both patients and family caregivers may likely incur as adverse consequences of their prolonged separation. In terms of potential solutions, the caregivers suggested being provided with more frequent meetings with the ICU clinicians, being offered alternative contact methods with the patients, and an improved orientation of the family visitation policy.

To the best of our knowledge, the present study is the first to survey caregivers of critically ill patients in a Korean ICU during the COVID-19 pandemic. Since the declaration of the COVID-19 pandemic, several studies, mostly based in the United States and Europe, have highlighted the adverse psychological outcomes in ICU caregivers such as fear, anxiety, depression, and post-traumatic stress disorder.²⁸⁻³⁰ While the causal association between the patient-family separation and adverse psychological outcomes of the caregivers needs further investigation, a study conducted in Turkey with 120 ICU family caregivers reported visitation restriction as an independent risk factor for worse depressive symptoms in caregivers.³¹ In South Korea, the effects of visitation restrictions on the outcomes of patients or families have not yet been investigated fully, except for one study that reported visitation restriction as a risk factor for the non-hypoactive delirium subtype and worse anxiety symptoms in patients.¹³

Our findings must be interpreted with caution for several reasons. First, the implementation of ICU visitation policies differs across countries. Moreover, the restrictions have changed over time with the evolution of the pandemic and with the increasing knowledge regarding it. In many Western countries, open and flexible ICU visitation policies were promoted until the COVID-19 pandemic. Since the start of the COVID-19 pandemic, while banning physical visitation became a common practice,^{24,32,33} reports from Canada,^{34,35} Spain,³⁶ and the Scandinavian countries³⁷ have indicated that instead of a complete ban, some institutions limited the number of visitors (e.g., one person at a time) and the duration of visits (e.g., < 30 min or one hour per day). In South Korea, open visitation had not been implemented in ICUs in the pre-pandemic period; typically, one or two relatives were allowed to visit for 30 min to a maximum of one hour once or twice a day.¹¹ Since the start of the COVID-19 pandemic, family visits have been completely banned in Korean ICUs. Therefore, without prior experience of open and flexible visitation, the expectations of typical ICU visitation are different amongst Korean caregivers, which may explain the lack of significant changes in the caregivers' quality of life and emotions, except for the worsening sadness and anxiety in the sample surveyed after the COVID-19 pandemic. In addition, similar to the high adherence to mask-wearing behavior in South Korea,³⁸ the lack of significant changes in the caregivers' reactions in our sample may indicate the influence of collectivism, which is a cultural value dominant in South Korea in which people tend to put more value on promoting public good during a crisis.³⁹ Second, considering that our survey period extended from February to July 2021, the caregivers' acceptance of the policy may have been different from that during the earlier phase of the COVID-19 pandemic.

In our sample, the caregivers were receptive to the visitation restrictions, but only approximately half of them were satisfied to updates they received on the patients' medical conditions. Such a modest level of satisfaction may have resulted from the increased informational needs from the caregivers when a physical visit was not possible. This speculation was consistent with the results reported in a qualitative study of 22 ICU family caregivers that was conducted before and during the COVID-19 period.²⁴ To resolve the

increased information requirements of the caregivers, video conferences or telephone calls have been used as alternative options; however, studies have reported that technology-supported contact may not be a complete substitute for physical visits in helping the caregivers understand the circumstances and function as care-partners in making shared decisions.^{40,41} According to a study that interviewed the caregivers after virtual ICU visits,⁴² while overall, the caregivers reacted positively, challenges such as the lack of touch and physical presence, highlighted the limitations of technology and the importance of using it as a complementary approach only.

Based upon our findings, we suggest several implications to clinical practice and research. The knowledge and technology to resolve the COVID-19 pandemic are growing rapidly, but the long-term course of the pandemic remain uncertain. Since lifting current restrictions is unlikely to happen soon, critical care settings need to identify sustainable solutions to maintain support and communication with the caregivers. As clinical implications, first of all, the visiting restrictions must be communicated to the public in a compassionate manner with sufficient justification of the potential benefits (e.g., community protection), scientific rationale, and plans to supplement the family support.⁴³ Furthermore, a system should be designated for evaluating exceptions to visiting restrictions and a transparent appeal process to best prevent the adverse consequences of visitation restrictions amongst patients and families.³⁴ As alternative support methods, adopting virtual visitation using various digital technology seems to be an ongoing trend.⁴⁴ But, scaling up virtual visitation demands system level efforts to reconcile various issues during implementation, such as ensuring family caregivers' accessibility to technology and allocating staff time. For future research, along with expanding implementation of virtual visitation, well-designed experimental studies are warranted to accumulate evidence to guide efficacious use of the alternative supporting strategies. Furthermore, more prospective cohort studies are necessary to identify the long-term consequences of visitation restrictions on the outcomes of patients, family caregivers, and ICU clinicians.

The present study had several limitations. First, it involved a small sample that was recruited from a single surgical ICU setting. The caregivers who refused or were unable to participate might have provided different responses. Second, patients' characteristics, especially age, ICU length of stay, and days on mechanical ventilation, were different between the survey periods due to changes in the patient census as a result of the opening of other local hospitals and increasing non-surgical cases (e.g., sepsis) in the allocation of ICU beds within our institution over the preceding two years. Despite our analytic efforts to control these issues, the potential effects from such extraneous factors must be considered. Third, to minimize participant burden, we attempted to keep our measures as simple as possible (e.g., VAS for emotional responses, checklist instead of using open-ended questions, etc.). Therefore, our data were limited in providing a full understanding of the caregiver reactions to visitation restriction policies. Lastly, our data contain cases wherein two caregivers were enrolled for one patient (11 cases in 2017; one case in 2021). Given the small proportion of such cases within each sample and small sample size, we did not employ further sophisticated analysis to control independence of the data.

Conclusions

The caregivers of the critically ill patients in the SICU have experienced worse anxiety and sadness due to the ICU visitation restriction policy implemented as a consequence of the COVID-19 pandemic. Most of the caregivers acknowledged that visitation restriction was a necessary policy; however, their information needs on their patients' medical condition and treatment plan were not adequately met. Along with the uncertainty concerning the COVID-19 pandemic, there were growing concerns about the potential long-term adverse

consequences of these visitation restrictions on the patients, families, and ICU health care team. Clinicians and researchers in Korea need to further support the informational needs of caregivers and develop and implement alternative strategies to promote contact between patients, caregivers, and ICU health care team members.

Declaration of Competing Interest

None.

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