

Survey of family satisfaction with intensive care units

A prospective multicenter study

Jinsoo Min, MD^a, Youlim Kim, MD^b, Jung-Kyu Lee, MD^c, Hannah Lee, MD^d, Jinwoo Lee, MD^e, Kyung Su Kim, MD^f, Young-Jae Cho, MD^b, You Hwan Jo, MD^g, Ho Geol Ryu, MD^d, Kyuseok Kim, MD^g, Sang-Min Lee, MD^e, Yeon Joo Lee, MD^{b,*}

Abstract

Although family satisfaction is an important indicator for quality improvement of intensive care units (ICUs), few studies have translated family satisfaction data into quality improvement in Asia. A prospective multicenter study was conducted to evaluate family satisfaction regarding the care of patients and their family.

The family satisfaction in the ICU (FS-ICU) questionnaire was administered from January 2015 to February 2016 at ICUs of 3 tertiary teaching hospitals in South Korea. Family members of adult patients, staying at an ICU for ≥ 48 hours, were included. Key factors affecting satisfaction were identified using quantitative and qualitative analyses.

In total, 200 family members participated in this survey. The mean score for overall family satisfaction (FS-ICU/total) was 75.4 ± 17.7 . The mean score for satisfaction with information/decision-making was greater than that for satisfaction with care (78.2 ± 18.2 vs 73.5 ± 19.4 ; $P \leq .001$). Family members who agreed to not resuscitate and whose patient died at the ICU had lower FS-ICU/total scores. When compared with hospital A, hospital C was an independent predictor with an FS-ICU/total score of < 75 . Families reported the least satisfaction for the atmosphere of the ICU, including the waiting room atmosphere and management of agitation.

We evaluated family satisfaction regarding ICUs for the first time in Asia using a validated tool. The decision to not resuscitate, ICU mortality, and ICU culture were associated with family satisfaction with critical care. Efforts should be targeted for improving factors that cause low family satisfaction when planning quality improvement interventions for ICUs in Asia.

Abbreviations: APACHE = acute physiology and chronic health evaluation, CI = confidence interval, DNR = do-not-resuscitate, EICU = emergency intensive care unit, FS-ICU = family satisfaction in ICU questionnaire, FS-ICU/care = satisfaction with care, FS-ICU/dm = satisfaction with information/decision-making, FS-ICU/total = overall satisfaction with intensive care unit, ICU = intensive care unit, MICU = medical intensive care unit, OR = odds ratio, SICU = surgical intensive care unit.

Keywords: critical care, family, intensive care unit, quality improvement, satisfaction

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^a Division of Pulmonary and Critical Care Medicine, Department of Internal Medicine, Daejeon St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Daejeon, ^b Division of Pulmonary and Critical Care Medicine, Department of Internal Medicine, Seoul National University Bundang Hospital, Seongnam, ^c Division of Pulmonary and Critical Care Medicine, Department of Internal Medicine, Seoul Metropolitan Government-Seoul National University Boramae Medical Center, ^d Department of Anesthesiology, ^e Division of Pulmonary and Critical Care Medicine, Department of Internal Medicine, ^f Department of Emergency Medicine, Seoul National University Hospital, Seoul, ^g Department of Emergency Medicine, Seoul National University Bundang Hospital, Seongnam, Republic of Korea.

* Correspondence: Yeon Joo Lee, Division of Pulmonary and Critical Care Medicine, Department of Internal Medicine, Seoul National University Bundang Hospital, Seoul National University College of Medicine, 82, Gumi-ro 173 Beon-gil, Bundang-gu, Seongnam-si 13620, Gyeonggi-do, Republic of Korea (e-mail: yjlee1117@snuh.org).

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1. Introduction

Two laws have recently been enacted in South Korea: an act on medical dispute arbitration in 2011 and an act on decisions on life-sustaining treatment in 2016. These medicolegal issues attracted public attention to decision-making on end-of-life care and medical dispute after death, which addressed the importance of patient-centered care. Moreover, the concept of “family-centered care” is also recognized in critical care.^[1] Because patients in the intensive care unit (ICU) are unable to actively participate in discussing about diagnosis and treatment, family members are important decision-makers in planning patient's care. In addition, a recent report from the Korean Society of Critical Care Medicine addressed several issues to improve the low level of quality of critical care, including patient and family satisfaction.^[2] Although there is much interest in improving the quality of care among ICU specialists in South Korea, medical resources especially in the ICU are not enough to satisfy the unmet needs of family-centered care.

There are several research papers and systemic reviews showing how interventions in the ICU affected both patient and family outcomes.^[3,4] Proactive strategies such as communication intervention and palliative care improved family satisfaction reduced length of stay in the ICU and increased the psychological quality of family members. Typical evaluations of family satisfaction about ICUs involve satisfaction with overall care, the decision-making process, and communication. Several

questionnaires have been proposed for measuring family satisfaction regarding the critical care experience, and applied in many randomized controlled trials for ICU interventions.^[5] Among them, the Family Satisfaction in the ICU questionnaire (FS-ICU) has well-established psychometric properties.^[6,7]

Studies regarding the ICU experience of family members in Asia are limited,^[8–10] and family satisfaction in the critical care setting has not yet been properly evaluated. As part of an ongoing quality improvement effort, we aimed to assess family satisfaction in the ICUs of hospitals affiliated with our university. This study aimed to describe levels of family satisfaction with critical care and determine which key variables correlate with high degrees of satisfaction.

2. Methods

2.1. Study design and data collection

A survey was prospectively conducted from January 2015 to February 2016 at the medical, surgical, and emergency ICUs (MICU, SICU, and EICU, respectively) of 3 tertiary teaching hospitals affiliated with the Seoul National University College of Medicine (Seoul National University Bundang Hospital, Seoul National University Hospital, and Seoul Metropolitan Government-Seoul National University Boramae Medical Center). An attending intensivist who worked with clinical fellows and residents was present at each ICU. The nurse-to-patient and physician-to-patient ratios were 1 to 2–3 and 1 to 5–10, respectively (Table 1).

Family members (next of kin or decision-makers) of adult patients, who attended one of the participating ICUs for ≥ 48 hours, were included. A minimum stay of 48 hours was used to ensure adequate exposure of the ICU.^[11,12] Patients who were admitted for postoperative care after an elective surgery, who had been intertransferred between ICUs, and who died before the questionnaire was completed were excluded. A copy of the questionnaire was given to family members of patients after 48 hours of ICU admission, and family members were asked to complete the questionnaire and return it in an envelope at the time of the patient's ICU discharge. The envelope was not opened until the final enrollment of study participants.

Family members were asked to provide data regarding age, sex, relationship to patient, and frequency of visits with the patient at the ICU. Patient characteristics (age, sex, Acute Physiology and Chronic Health Evaluation (APACHE) II score, ICU mortality,

and ICU length of stay) were obtained from the electronic patient data management system. This study was approved by the Institutional Review Board of Seoul National University Bundang Hospital (IRB No. B-1410-272-005), and all participants provided written informed consent.

2.2. FS-ICU questionnaire

A short version of the FS-ICU consisting of 24 items,^[7] each of which contained 5 Likert response options ranging from “poor” to “excellent,” was used. This survey measures 2 broad parts. The first part broadly assessed satisfaction level over a broad range of domains related to ICU care. The second part focused more on satisfaction with decision-making. Written responses were required for the following 3 open-ended items: Do you have any suggestions for improving care in the ICU? Do you have any comments on what ICU staff did well? Please add any comments or suggestions that you feel may help hospital staff. The FS-ICU questionnaire has been previously translated to Korean and validated.^[13] Individual items of the FS-ICU were transformed to a scale between 0 and 100, with higher numbers indicating greater satisfaction. The FS-ICU provides the following 3 summary scores: FS-ICU/care (satisfaction with care), FS-ICU/dm (satisfaction with information/decision-making), and FS-ICU/total (overall satisfaction with the ICU).

2.3. Statistical analysis

Data regarding the patients, respondents, and answers to the surveys were reported as means, standard deviations, frequency tables, rates, and proportions. Pearson χ^2 or Fisher exact test was used for dichotomous variables. Student *t* test, paired *t* test, and 1-way analysis of variance were used for continuous variables. A binary logistic regression analysis was conducted to identify predictors of family satisfaction scores among patient characteristics. To create a binary dependent variable for logistic regression, the family satisfaction scores (FS-ICU/total, FS-ICU/care, and FS-ICU/dm) were assigned to 2 categories based on the mean FS-ICU/total score (i.e., scores < 75 vs ≥ 75). All tests were 2-sided with an alpha level of 0.05 and were conducted using PASW Statistics for Windows version 18.0 (SPSS Inc, Chicago, IL).

3. Results

From January 2015 to February 2016, family members of 176 ICU patients agreed to participate in this study, and 200

Table 1
Status of intensive care units in the participating hospitals.

Hospital ICU	A		B		C
	MICU	EICU	MICU	SICU	MICU
Number of patients admitted to ICU per year	843	247	690	3230	692
Number of ICU beds	16	3	12	32	17
Number of attending intensivists	2	1	2	6	2
Number of ICU fellows	1	0–1	1	2	1
Number of ICU residents	3	1	4	2	2
Nurse-to-patient ratio	1:2 or 1:3	1:2 or 1:3	1:2 (day) or 1:3 (night)	1:2.2	1:3
Waiting room for family members	Yes	Yes	Yes	Yes	Yes
Family meeting room	Yes	No	No	No	Yes
Number of visits to ICU	2	2	2	2	2
Additional facilities for family members	No	No	No	No	No

EICU=emergency intensive care unit, ICU=intensive care unit, MICU=medical intensive care unit, SICU=surgical intensive care unit.

Table 2
Baseline characteristics of patients and family members.

Characteristics	N (%) or mean ± standard deviation
Patients (N=176)	
Age, y	64.4 ± 17.8
Sex (male)	109 (64.9%)
Previous ICU admission (yes)	76 (38%)
Length of ICU stay, d	15.0 ± 13.4
APACHE II score	23.4 ± 10.7
ICU survivors	136 (80.4%)
Respondents (N=200)	
Age, y	51.6 ± 14.0
Sex (male)	100 (50.0%)
Relationship with patient	
Offspring	115 (57.5%)
Parents	13 (6.5%)
Spouse	49 (24.5%)
Other family	11 (5.5%)
Siblings	12 (6.0%)
Prior experience with ICU	76 (38.0%)
Cohabitation with patient	105 (52.5%)
How often do you see the patient	
More than weekly	136 (70.5%)
Weekly	19 (9.8%)
Monthly	14 (18.1%)
Yearly	3 (1.6%)

APACHE = acute physiology and chronic health evaluation score, ICU = intensive care unit, N = number.

questionnaires were received. The numbers of questionnaires received from all the MICUs, EICUs, and SICUs were 166, 21, and 3 respectively. The baseline characteristics of the patients and respondents are shown in Table 2. The mean APACHE II score of the enrolled patients was 23.4, with an ICU survival rate of 80.4%. Most respondents had a mean age of 51.6 years, were children of the patient, and visited the patients at least once a week.

The mean FS-ICU/total score was 75.4 ± 17.7 (Table 3). The mean FS-ICU/dm score was slightly greater than the FS-ICU/care score (78.2 ± 18.2 vs 73.5 ± 19.4; *P* < .001). Families reported the greatest satisfaction with the ICU staff's willingness to answer questions (item #16). The item with the lowest scores was the ICU waiting room atmosphere (item #13). Hospital A had the highest mean FS-ICU/total score, followed by hospitals B and C (A, 77.9 ± 15.8; B, 73.3 ± 19.5; and C, 64.6 ± 19.1; *P* = .117). Family members who signed a do-not-resuscitate (DNR) order had lower FS-ICU/total scores than those who did not (68.3 ± 17.1 vs 76.9 ± 17.9; *P* = .001). Family members of patients who died at the ICU had lower FS-ICU/total scores than family members of patients who survived (66.6 ± 18.3 vs 77.1 ± 17.4; *P* = .001).

Multiple regression analysis was conducted to identify patient characteristics that might have influenced family satisfaction (Table 4). ICU mortality was an independent predictor of FS-ICU/total scores < 75 (odds ratio [OR] = 0.368; 95% confidence interval [CI] = 0.149–0.906) and FS-ICU/care scores < 75 (OR =

Table 3
Scores for family satisfaction with care and decision making.

Items	Poor	Fair	Good	Very good	Excellent	Mean ± SD
Overall satisfaction with care						73.5 ± 19.4
Care of patient						
Courtesy, respect, and compassion toward patient	2.0%	3.5%	16.5%	38.0%	40.0%	77.6 ± 23.4
Management of pain	2.5%	7.5%	15.0%	37.0%	38.0%	75.1 ± 25.7
Management of breathlessness	2.5%	4.0%	14.0%	33.0%	46.5%	79.3 ± 24.6
Management of agitation	7.5%	11.0%	15.0%	35.0%	31.5%	68.0 ± 30.7
Care of family						
How well the staff considered family needs	1.0%	2.0%	13.0%	35.5%	48.5%	82.1 ± 21.0
How well the staff provided emotional support for family	2.0%	6.5%	17.5%	34.0%	40.0%	75.9 ± 25.2
Coordination and teamwork by staff	0.5%	5.0%	19.0%	35.0%	40.5%	77.5 ± 22.8
Courtesy, respect, and compassion toward family	0.5%	3.0%	16.5%	34.5%	45.5%	80.4 ± 21.5
Professional care						
Skill and competence of nurses	1.0%	4.0%	12.5%	38.0%	44.5%	80.3 ± 22.1
Frequency of communication by nurses	3.5%	5.0%	18.0%	31.0%	42.5%	76.0 ± 26.5
Skill and competence of doctors	2.5%	5.5%	13.5%	33.0%	45.5%	78.4 ± 25.3
ICU environment						
Atmosphere of the ICU	3.5%	10.5%	19.0%	38.0%	29.0%	69.6 ± 27.1
Atmosphere of the ICU waiting room	35.5%	24.5%	15.0%	13.0%	12.0%	35.4 ± 34.8
Satisfaction with level or amount of care patient received	1.0%	6.5%	25.5%	33.5%	33.5%	73.0 ± 24.2
II. Overall satisfaction with decision making						78.2 ± 18.2
Information needs						
Frequency of communication by doctors	3.0%	7.5%	23.0%	30.5%	36.0%	72.3 ± 26.9
Willingness of staff to answer questions	1.0%	1.5%	15.0%	37.5%	45.0%	81.0 ± 20.9
Staff provided understandable explanations	0.5%	2.0%	20.0%	29.5%	48.0%	80.6 ± 21.8
Honesty of information provided by staff about patient's condition	2.0%	3.0%	15.0%	32.5%	47.5%	80.1 ± 23.6
Completeness of information by staff about what was happening	0.5%	4.0%	15.5%	33.0%	47.0%	80.5 ± 22.2
Consistency of information about patient's condition	1.5%	3.5%	19.0%	29.5%	46.5%	79.0 ± 23.8
Decision-making process						
Feel included in the decision-making process	2.5%	2.0%	19.5%	22.5%	53.5%	80.6 ± 24.9
Feel supported during the decision-making process	5.0%	2.5%	18.0%	30.0%	44.5%	76.6 ± 27.1
Feel included in patient care	5.0%	3.5%	19.5%	37.0%	35.0%	73.4 ± 26.7
Adequate time to address concerns and answer questions	22.0%	—	—	—	78.0%	78.0 ± 41.5
III. Total score of family satisfaction with care in the ICU						75.4 ± 17.7

ICU = intensive care unit, IQR = interquartile range, SD = standard deviation.

Table 4
Multivariate analysis of family satisfaction by patient characteristics.

Variables	Total score of family satisfaction			Satisfaction with care			Satisfaction with information/decision-making		
	OR	95% CI	P value	OR	95% CI	P value	OR	95% CI	P value
Age	1.008	0.989–1.027	.395	1.010	0.991–1.029	.307	1.011	0.992–1.030	.257
Male	0.867	0.452–1.664	.668	0.862	0.449–1.685	.657	0.699	0.358–1.367	.295
APACHE	0.965	0.927–1.005	.084	0.965	0.927–1.005	.084	0.973	0.934–1.013	.188
ICU mortality	0.368	0.149–0.906	.030	0.304	0.121–0.765	.011	0.469	0.192–1.147	.097
ICU LOS	0.998	0.971–1.026	.895	0.992	0.964–1.021	.590	0.995	0.968–1.023	.741
Hospitals									
A									
B	0.494	0.210–1.158	.105	0.678	0.289–1.591	.372	0.378	0.159–0.900	.028
C	0.139	0.023–0.843	.032	0.165	0.027–1.012	.051	0.118	0.019–0.709	.020
Types of ICU									
MICU									
EICU	1.725	0.109–27.185	.698	2.055	0.129–32.649	.610	1.709	0.107–27.295	.704
SICU	1.981	0.735–5.342	.177	2.305	0.851–6.242	.100	2.303	0.843–6.286	.104

APACHE = acute physiology and chronic health evaluation score, CI = confidence interval, EICU = emergency intensive care unit, ICU = intensive care unit, LOS = length of stay, MICU = medical intensive care unit, OR = odds ratio, SICU = surgical intensive care unit.

0.304; 95% CI=0.121–0.765). Compared with hospital A, hospital C was an independent predictor of scores <75 for FS-ICU/total (OR=0.139; 95% CI=0.023–0.843) and FS-ICU/dm (OR=0.118; 95% CI=0.019–0.709). Hospital B was an independent predictor of FS-ICU/dm scores <75 (OR=0.378; 95% CI=0.159–0.900) compared with hospital A. On univariate analysis, a longer ICU stay was associated with FS-ICU/care scores <75; however, this association was insignificant after multivariate analysis (Supplemental Table, <http://links.lww.com/MD/C389>).

For open-ended questions, 241 comments were received and categorized into 7 themes with 31 issues (Table 5). Except for comments regarding the family members' gratitude and satisfaction, the most frequently mentioned positive theme was overall satisfaction with communication (20.3%). However, there were various comments regarding improving communication with the ICU staff, such as frequency of communication, delivering detailed information about the patient's status, and easy access to information.

The ICU atmosphere was the most frequently mentioned negative theme (9.1%). Only negative comments were received regarding the waiting room atmosphere (i.e., lack of amenities for families, such as chair, clock, and refrigerator). The respondents also had comments about crowding of hospital beds, lack of privacy, and poor ventilation and lighting in the ICU patient rooms. The most frequently identified negative comments about the staff theme were shortage of staff.

4. Discussion

To the best of our knowledge, this is the first prospective multicenter study conducted in Asia to evaluate family satisfaction with the ICU using a validated tool. Family satisfaction became an important indicator of quality improvement in the ICU.^[13] An issue regarding family satisfaction in the ICU has been mentioned in a recent review in Asia,^[2] but few studies have translated family satisfaction data into quality improvement. In our study, most of the family members were satisfied with the ICU care and decision-making process, except with the ICU waiting room atmosphere. Although the overall FS-ICU score was relatively high in our study, it was lower than those of the United Kingdom,^[14] Germany,^[12] and Hong Kong (80.3 ± 16.8, 78.3 ±

14.3, and 78.1 ± 14.3, respectively).^[15] In a large qualitative study in the United Kingdom, the overall FS-ICU score was >80, which suggests opportunities for further improving family satisfaction by quality improvement. There were only a few Asian studies involving the FS-ICU. Lam et al^[15] used the original

Table 5
Written comments categorized by themes.

Themes	Number (%)	Positive	Negative
Communication	64 (26.6%)	49 (20.3%)	15 (6.2%)
Overall satisfaction with communication		48 (20.0%)	0
Honesty of information		1 (0.4%)	0
Frequency of communication		0	3 (1.2%)
Easiness of accessing information		0	3 (1.2%)
Delivering detailed information		0	3 (1.2%)
Consistency of communication across staff		0	2 (0.8%)
Using phone for delivering information		0	1 (0.4%)
Openness		0	1 (0.4%)
Directness about patient's prognosis		0	1 (0.4%)
Understandable communication		0	1 (0.4%)
Treatment and care	44 (18.3%)	32 (13.3%)	12 (5.0%)
Overall satisfaction with treatment		16 (6.6%)	4 (1.7%)
Overall satisfaction with care		16 (6.6%)	8 (3.3%)
Staff	38 (15.8%)	21 (8.7%)	17 (7.1%)
Kindness		21 (8.7%)	0
Shortage		0	7 (2.9%)
Poor attitude		0	4 (1.7%)
Lack of competency		0	4 (1.7%)
Concern for staff's health		0	2 (0.8%)
Gratitude and satisfaction	31 (12.9%)	31 (12.9%)	0
Statements of gratitude		19 (7.9%)	0
Statements of satisfaction		12 (5.0%)	0
Patient and family	25 (10.4%)	10 (4.1%)	15 (6.2%)
Respect and compassion shown to patient		1 (0.4%)	8 (3.3%)
Respect and compassion shown to family		7 (2.9%)	7 (2.9%)
Involvement of family in decision-making		2 (0.8%)	0
Atmosphere of intensive care unit	23 (9.5%)	1 (0.4%)	22 (9.1%)
Atmosphere of waiting room		0	13 (5.4%)
Atmosphere of patient room		1 (0.4%)	9 (3.7%)
Others	16 (6.6%)	1 (0.4%)	15 (6.2%)
Visiting hours		1 (0.4%)	6 (2.5%)
Hygiene		0	5 (2.1%)
Obtaining permission		0	1 (0.4%)
Parking		0	1 (0.4%)
Medical costs		0	1 (0.4%)
Transfer to another hospital		0	1 (0.4%)
Total	241 (100%)	145 (60.2%)	96 (39.8%)

FS-ICU^[6] to evaluate family satisfaction in a mixed medical-surgical adult ICU in Hong Kong. Dailsay-Gallardo and Perez^[16] investigated satisfaction with end-of-life care for dying patients in a general adult ICU in the Philippines. Compared with previous Asian studies, this study has several strengths: it is a multicenter prospective study conducted at 3 different hospitals in different geographic locations, and the validated Korean version of the FS-ICU^[17] was used.

In this study, placing a DNR order and ICU mortality significantly lowered the level of overall family satisfaction. Due to the Confucian culture in Asia, discussing dying or a patient's death is sensitive for both family members and ICU doctors.^[18] Under the influence of Confucian philosophy, truth telling in Asia is complicated by several factors: harmony of family as an essential value, family as a key player in medical decision-making, and taboo about discussing death and related issues. Therefore, family members require additional time to accept a patient's bad prognosis. In addition, healthcare professionals should focus more and be careful about how to communicate the patient's critical illness to family members. In our study, the APACHE II score, although insignificant, tended to be negatively associated with family members' satisfaction ($P = .084$). This association is in line with the mortality finding in our study since a higher APACHE II score is associated with more severe illness of the patients.

On the contrary, Wall et al^[19] showed that the families of patients dying in the ICU were more satisfied with their ICU experience than those of ICU survivors. Other researchers have shown that family satisfaction was independent of patient- or family-derived characteristics and patient survival status.^[12,20] Depending on cultural and socioeconomic background, patients and their families have different perceptions about care and treatment and different feelings and demands from healthcare professionals. Moreover, Fenton et al found that higher patient satisfaction was associated with greater use of inpatient services, higher overall health care expenditure, and increased mortality, using the national Medical Expenditure Panel Study in the United States.^[21] Since most satisfaction surveys are based on subjective experiences, there are several criticisms about assessing patient or family satisfaction.^[22] For example, patient or family feedback is not credible because of lack of formal medical training and could be confounded by factors indirectly associated with quality of process. Therefore, when performing a survey of satisfaction and analyzing its data, researchers should be careful about interpreting the results and utilizing the data.

In this study, the ICU culture was an important factor affecting family satisfaction. At hospital A, there were plans to conduct multidisciplinary family meetings to improve family satisfaction in the MICU.^[23] These meetings might have encouraged the medical staff to focus on care for family members. Hospital B was strongly conservative; therefore, it was difficult to introduce new concepts to the ICUs, such as patient and family satisfaction. Hospital C was located in a low socioeconomic status area compared with the other 2 hospitals, which might have adversely affected family satisfaction. Low socioeconomic status is a major determinant of healthcare access, and lower income predicts lower satisfaction with care.^[24,25]

In a previous study in South Korea, family needs were measured to understand problems in the ICU using the Critical Care Family Needs Inventory.^[8] According to this research, the family members' personal needs for comfort and support were low. Families were more likely to sacrifice their inconveniences and discomfort for the patient's needs, and believed that the

patient's needs should take precedence over family needs. Since this study was conducted, families have increased their expectations of convenient facilities and emotional support along with advancement of treatments in the ICUs of hospitals, and our study showed that the "ICU waiting room atmosphere" had the lowest score and was frequently mentioned as a negative comment. Thus, hospital administrators should consider these findings when designing a new ICU for opportunities of improvement of family satisfaction.

We observed that the FS-ICU/care score was significantly lower than the FS-ICU/dm score, probably due to a couple of characteristics of the healthcare system in South Korea. First, patients and their families have developed a higher expectation of healthcare services due to improvements in socioeconomic status and more opportunities for accessing medical information in South Korea. However, the level of reimbursement for critical care is so low that hospital administrators are reluctant to invest in the ICU.^[2] Without adequate investment, hospitals fail to meet healthcare consumer satisfaction such as quality of healthcare and facilities provided in the ICU. Second, the number of medical lawsuits has increased,^[26] and medical law regarding the doctor's duty to provide information has been strengthened in South Korea.^[27] The medical staffs often spend much time explaining a patient's medical condition and the necessity for treatment in detail; therefore, the family's satisfaction with obtaining information and the decision-making process might have been higher than expected.

Our study has several limitations. First, response bias could not be ruled out because the response rate was not determined. Family members who were dissatisfied with the ICU might have not participated in the survey. Schwarzkopf et al^[12] showed that nonresponders were more likely to be family members of patients with greater illness severity and higher ICU mortality. The characteristics of nonresponders would help in understanding the hidden nature of family satisfaction. Second, the number of enrolled participants among the hospitals was uneven, and most enrolled patients stayed at the MICU. Fewer patients in the SICU and EICU were suitable for study enrollment, several patients were admitted for postoperative care in both SICU and EICU, and a number of patients with prolonged length of stay in the EICU were intertransferred to the MICU for additional care of comorbidities. Therefore, our study findings cannot be generalized to other ICU settings in different geographic regions. Moreover, Dodek et al^[28] found that there was strong positive relationships between some aspects of organizational/safety culture and the satisfaction of family members.

The enrollment of family members was the most difficult process during this prospective study. Two reasons may be proposed for this difficulty: a lack of resources and funds and a lack of interest of healthcare workers and family members. Although we were able to obtain research funding from the hospital, the funding was limited and we could not hire a dedicated workforce for our research. Thus, we could not contact all the eligible family members and explain our study to actively enroll the participants. Second, the interest in ICU satisfaction was low even among some intensivists and investigators, which resulted in an uneven enrollment across the ICUs. The SICU was a fully open model ICU, so the role of the intensivist (anesthesiologist) of the SICU was limited, especially in terms of forming a relationship with the patient's families. To solve this problem, it is necessary to inform both the medical staff and family members about the importance of family satisfaction, an indicator of ICU quality management.

In conclusion, the decision to place a DNR order, ICU mortality, and ICU culture was associated with family satisfaction with critical care. The atmosphere of the patient and waiting rooms in the ICU received the lowest family satisfaction scores. Furthermore, identifying the unmet needs of the families was possible based on the satisfaction survey of the ICU using the FS-ICU. Efforts should be made to improve items with low family satisfaction when planning interventions for ICU quality improvement.

Author contributions

Conceptualization: Jinsoo Min, Yeon Joo Lee.

Data curation: Youlim Kim, Yeon Joo Lee.

Formal analysis: Jinsoo Min, Youlim Kim, Yeon Joo Lee.

Funding acquisition: Yeon Joo Lee.

Investigation: Yeon Joo Lee.

Methodology: Jinsoo Min, Yeon Joo Lee.

Project administration: Yeon Joo Lee.

Resources: Jung-Kyu Lee, Hannah Lee, Jinwoo Lee, Kyung Su Kim, Young-Jae Cho, You Hwan Jo, Ho Geol Ryu, Kyuseok Kim, Sang-Min Lee, Yeon Joo Lee.

Software: Yeon Joo Lee.

Supervision: Yeon Joo Lee.

Validation: Jinsoo Min, Yeon Joo Lee.

Visualization: Yeon Joo Lee.

Writing – original draft: Jinsoo Min, Yeon Joo Lee.

Writing – review & editing: Jinsoo Min, Youlim Kim, Jung-Kyu Lee, Hannah Lee, Jinwoo Lee, Kyung Su Kim, Young-Jae Cho, You Hwan Jo, Ho Geol Ryu, Kyuseok Kim, Sang-Min Lee, Yeon Joo Lee.

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