

Transcultural Adaptation and Validation of the Family Satisfaction in the Intensive Care Unit Questionnaire in a Korean Sample

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Background: A number of questionnaires designed for analyzing family members' inconvenience and demands in intensive care unit (ICU) care have been developed and validated in North America. The family satisfaction in the intensive care Unit-24 (FS-ICU-24) questionnaire is one of the most widely used of these instruments. This study aimed to translate the FS-ICU-24 questionnaire into Korean and validate the Korean version of the questionnaire.

Methods: The study was conducted in the medical, surgical, and emergency ICUs at three tertiary hospitals. Relatives of all patients hospitalized for at least 48 hours were enrolled for this study participants. The validation process included the measurement of construct validity, internal consistency, and interrater reliability. The questionnaire consists of 24 items divided between two subscales: satisfaction with care (14 items) and satisfaction with decision making (10 items).

Results: In total, 200 family members of 176 patients from three hospitals completed the FS-ICU-24 questionnaire. Construct validity for the questionnaire was superior to that observed for a visual analog scale (Spearman's $r = 0.84$, $p < 0.001$). Cronbach's α s were 0.83 and 0.80 for the satisfaction with care and satisfaction with decision making subscales, respectively. The mean (\pm standard deviation) total FS-ICU-24 score was 75.44 ± 17.70 , and participants were most satisfied with consideration of their needs (82.13 ± 21.03) and least satisfied with the atmosphere in the ICU waiting room (35.38 ± 34.84).

Conclusions: The Korean version of the FS-ICU-24 questionnaire demonstrated good validity and could be a useful instrument with which to measure family members' satisfaction about ICU care.

Key Words: family; intensive care units; satisfaction; validation studies.

Introduction

Most intensive care unit (ICU) patients cannot explain their symptoms or complaints, because intubation and other ICU-related procedures prevent them from communicating with their doctors or other caregivers [1]. Therefore, family members often participate in decision making on behalf of patients during the treatment process [2]. However, over half of such family members have often experienced anxiety or depression and those experiences might affect decision making in the ICU [3]. Additionally, improved satisfaction of the ICU patients' relatives appears to reduce ICU admission

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days and increase the psychological quality of family members [4,5]. Therefore, understanding family members' needs and supporting their emotional stress through frequent communication are important for ICU intensivists [1].

Since the 1970s, several questionnaires have been presented to identify the family members' demands and satisfaction with care, with ICU-related [6,7], and the family satisfaction in the intensive care unit-24 (FS-ICU-24) questionnaire is one of the most widely used instruments. Since Heyland and Tranmer [6] developed the FS-ICU-24 questionnaire in 2001, both the original and modified versions of have been used, and it has been adapted for use in other countries such as Turkey and Germany [8,9].

To translate the FS-ICU-24 questionnaire is fundamental if it is to be used to assess patients' family members' satisfaction with ICUs within a particular culture and perform a multicultural comparison. There is no validation model for use of the FS-ICU-24 questionnaire as for assessing of patients' family members' satisfaction with ICU care in Korea. Therefore, this study aimed to translate the FS-ICU-24 questionnaire into Korean and validate the Korean version of the questionnaire and used patient data to evaluate interrater reliability between patients' family members.

Materials and Methods

1) Study design and data collection

The study was conducted prospectively in the medical, surgical, and emergency ICUs at three tertiary hospitals (two are tertiary hospitals with more than 1,000 beds and the third has approximately 700 beds; each hospital has 63, 65, and 32 ICU beds, respectively) between January 2015 and February 2016. Most patients who were admitted to the participating ICUs had diseases such as pulmonary or cardiac problems, but post-surgical patients were also treated in the ICUs. Relatives of all patients hospitalized for at least 48 hours were considered eligible for

participation in the study. Patients' relatives included spouses, parents, children, and siblings, and we endeavored to obtain responses from at least two relatives for each patient. Physicians provided the questionnaires to family members and received completed questionnaires immediately or at the next ICU visiting time.

2) FS-ICU-24 questionnaire

Data were collected using the Korean translation of the FS-ICU-24 questionnaire, which was developed and validated by Heyland and Tranmer [6] in 2001 and modified by Wall et al. [10] in 2007. We obtained permission to use the questionnaire from one of the developers prior to commencement of the study. Two experts translated the original questionnaire into Korean individually, and then integrated their individual translations to form a single translation. This was retranslated into English by two additional experts, and an English language expert compared this version to the original version. The Korean version was considered complete upon confirmation that it did not differ from the original version (the final Korean version of FS-ICU-24 questionnaire was added to the supplementary materials) [11].

The survey was divided into two sections: a visual analog scale (VAS) and a 24-item questionnaire. In the first section, patients' family members indicated their overall satisfaction, satisfaction with care, and satisfaction with decision making using the VAS, which ranged from 1 to 10, with lower scores indicating greater satisfaction. In the second section, patients' family members indicated their satisfaction with ICU care by responding to closed questions in the questionnaire. The 24 questionnaire items were divided between two subscales: satisfaction with care (14 items) and satisfaction with decision making (10 items). Responses were provided using a scale ranging from 1 (excellent) to 5 (very poor), and each item was recoded to provide a score between 0 and 100, as follows: 0 = very poor, 25 = poor, 50 = good, 75 = very good, and 100 = excellent [6]. Higher scores indicated greater satisfaction.

3) Validation and statistical analysis

Data were analyzed using SPSS software for Windows version 18.0 (SPSS Inc., Chicago, IL, USA). Categorical and continuous data were presented as means and standard deviations, and a chi-square test was performed to compare the categorical variables. In this study, the validation was evaluated by construct validity, internal consistency, and inter-rater reliability. Construct validity was assessed by comparing the VAS scores obtained in the first section of the survey with the scores for the 24 questionnaire items included in the second section of the survey, using Spearman's correlation coefficients. Internal consistency was evaluated using Cronbach's α for each item in the questionnaire. Inter-rater reliability

was evaluated by comparing responses between different family members of the same patient using intraclass correlation coefficients (ICCs). The significance level was set at $p < 0.05$.

Results

1) Patients' and family members' baseline characteristics

Table 1 and 2 show the baseline characteristics for the ICU patients and their family members. The patients' average age was 64.46 ± 17.38 years, and more than half of the patients were men ($n = 109$, 64.9%). Their mean duration of hospitalization in the ICU was 14.95 ± 13.41 days, and their average Acute Physiology and Chronic Health Evaluation-II score was 23.40 ± 10.71 . The sex distribution of the overall sample was even (male to female ratio = 1:1), and most of the patients' relatives were their children or spouses.

Table 1. Baseline characteristics of intensive care unit patients

Variables	Patients
Age	64.46 ± 17.38
Sex (male)	109/168 (64.9)
Previous intensive care unit Hx. (yes)	76/168 (45.2)
Length of stay	14.95 ± 13.41
APACHE II score	23.40 ± 10.71
Intensive care unit survivor	136/168 (81.0)
Cause of intensive care unit admission	
Respiratory	70 (41.7)
Cardiovascular	21 (12.5)
Neurologic	3 (1.8)
Sepsis, septic shock	32 (19.0)
Renal replacement therapy	16 (9.5)
Others	26 (15.5)

Values are expressed as mean \pm standard deviation or n (%).

Hx.: history; APACHE II: Acute physiology and chronic health evaluation score.

2) Construct validity

Spearman's correlation coefficients for overall satisfaction, satisfaction with care, and satisfaction with decision making were 0.84 ($p < 0.001$), 0.83 ($p < 0.001$), and 0.80 ($p < 0.001$), respectively (Table 3). In the subgroup analysis of construct validity with the enrolled three hospitals, the results were consistent with those of the total population (Table 3).

3) Internal Consistency

Cronbach's α for satisfaction with care (0.94) and satis-

Table 2. Baseline characteristics of family members

Relationship	Value	Age	Sex (M:F)
Offspring	112 (56.0)	46.95 ± 11.91	59:53
Spouse	50 (25.0)	61.14 ± 11.93	22:28
Parents	13 (6.5)	51.42 ± 12.98	6:7
Other family*	13 (6.5)	53.08 ± 22.39	5:8
Siblings	12 (6.0)	52.92 ± 8.94	8:4

Values are expressed as mean \pm standard deviation or n (%).

M: male; F: female.

*Other family included uncle, aunt, cousins and so on.

Table 3. Construct validity

Variables	r	p-value
Total group		
Overall satisfaction	0.84	<0.001
Overall satisfaction with care	0.83	<0.001
Overall satisfaction with information and decision making	0.80	<0.001
Subgroup analysis		
Hospital A		
Overall satisfaction	0.87	0.002
Overall satisfaction with care	0.82	0.005
Overall satisfaction with information and decision making	0.84	0.006
Hospital B		
Overall satisfaction	0.84	<0.001
Overall satisfaction with care	0.84	<0.001
Overall satisfaction with information and decision making	0.80	<0.001
Hospital C		
Overall satisfaction	0.77	<0.001
Overall satisfaction with care	0.76	<0.001
Overall satisfaction with information and decision making	0.75	<0.001

faction with decision making (0.88) were both high (Table 4). Additionally, all items about both the satisfaction with care and satisfaction with decision making subscales demonstrated high levels of internal consistency regardless of whether other items were deleted. In the subgroup analysis of internal consistency of family satisfaction, Cronbach's alpha scores for each hospital were similar to those of the total group (Table 4).

4) Reliability

Twenty-four pairs of responses provided by two family members of one patient were used to measure interrater reliability (Table 5, Figure 1). The ICC for the satisfaction with care subscale was slightly low (0.49, $p = 0.006$), with a higher ICC (0.64, $p < 0.001$) for the satisfaction with decision making subscale.

Discussion

The study aimed to translate the FS-ICU-24 questionnaire into Korean and validate the translated Korean

version of the questionnaire. The results showed that the Korean version showed good construct validity and internal consistency and would be the useful diagnostic tool for evaluating of the satisfaction of family members', experiencing ICU care.

While previous ICU care has focused on increasing survival rates, ICU intensivists have recently become interested in the qualitative improvement of ICU care by enhancing communication with patients and their family members and evaluating their satisfaction [12,13]. Several tools, such as the Critical Care Family Needs Inventory, Critical Care Family Satisfaction Survey, and FS-ICU-24 questionnaire, have been used to evaluate satisfaction with ICU care [14-16]. In addition, the original versions of these surveys have been adapted for use in other cultures, such as those of Turkey and The Netherlands [8,15].

In this study, we validated construct validity, internal consistency, and interrater reliability between family members. Results from Table 3 show that the questionnaire demonstrated excellent construct validity, with respect to overall satisfaction, satisfaction with care, and

Table 4. Internal consistency of family satisfaction

Items	Mean \pm SD	Cronbach's alpha if item deleted
Total group		
Cronbach's alpha for satisfaction with care		0.94
Courtesy, respect and compassion toward patient	77.63 \pm 23.43	0.94
Management of pain	75.13 \pm 25.74	0.94
Management of breathlessness	79.25 \pm 24.57	0.94
Management of agitation	68.00 \pm 30.71	0.94
How well staff considered family needs	82.13 \pm 21.03	0.94
How well staff provided emotional support toward family	75.88 \pm 25.24	0.94
Coordination and teamwork by staff	77.50 \pm 22.83	0.94
Courtesy, respect and compassion toward family	80.38 \pm 21.54	0.94
Skill and competence of intensive care unit nurses	80.25 \pm 22.08	0.94
Frequency of communication with intensive care unit nurses	76.00 \pm 26.51	0.94
Skill and competence of intensive care unit doctors	78.38 \pm 25.27	0.94
Atmosphere of intensive care unit	69.63 \pm 27.10	0.94
Atmosphere in the intensive care unit waiting room	35.38 \pm 34.84	0.95
Overall satisfaction with care	73.00 \pm 24.22	0.94
Cronbach's alpha for satisfaction with decision making		0.88
Frequency of communication	72.25 \pm 26.85	0.86
Ease of getting information	81.00 \pm 20.86	0.86
Understanding of Information	80.63 \pm 21.77	0.85
Honesty of Information	80.13 \pm 23.55	0.85
Completeness of Information	80.50 \pm 22.16	0.85
Consistency of Information	79.00 \pm 23.84	0.86
Included in decision making process	80.63 \pm 24.87	0.87
Support during decision making process	76.63 \pm 27.12	0.86
Control over the care of your family member	73.38 \pm 26.65	0.87
Adequate time to have your concerns and questions	78.00 \pm 41.53	0.90
Subgroup analysis		
Hospital A		
Cronbach's alpha for satisfaction with care		0.93
Courtesy, respect, and compassion toward patient	66.67 \pm 30.62	0.92
Management of pain	52.78 \pm 42.29	0.92
Management of breathlessness	72.22 \pm 26.35	0.92
Management of agitation	75.00 \pm 17.68	0.92
How well staff considered family needs	41.67 \pm 43.30	0.92
How well staff provided emotional support toward family	63.89 \pm 25.35	0.92
Coordination and teamwork by staff	72.22 \pm 19.54	0.92
Courtesy, respect, and compassion toward family	77.78 \pm 19.54	0.92
Skill and competence of intensive care unit nurses	75.00 \pm 21.65	0.92
Frequency of communication with intensive care unit nurses	50.00 \pm 37.50	0.92
Skill and competence of intensive care unit doctors	72.22 \pm 23.20	0.92
Atmosphere of intensive care unit	66.67 \pm 25.00	0.93

Table 4. Continued

Items	Mean \pm SD	Cronbach's alpha if item deleted
Atmosphere in the intensive care unit waiting room	36.11 \pm 45.26	0.92
Overall satisfaction with care	66.67 \pm 21.65	0.92
Cronbach's alpha for satisfaction with decision making		0.76
Frequency of communication	66.67 \pm 21.65	0.75
Ease of getting information	75.00 \pm 12.50	0.74
Understanding of information	75.00 \pm 21.65	0.73
Honesty of information	63.89 \pm 30.90	0.69
Completeness of information	72.22 \pm 26.35	0.70
Consistency of information	61.11 \pm 35.60	0.69
Included in decision making process	72.22 \pm 23.20	0.71
Support during decision making process	61.11 \pm 25.35	0.70
Control over the care of your family member	58.33 \pm 33.07	0.72
Adequate time to have your concerns and questions addressed	55.56 \pm 52.71	0.87
Hospital B		
Cronbach's alpha for satisfaction with care		0.95
Courtesy, respect, and compassion toward patient	74.00 \pm 25.15	0.95
Management of pain	72.33 \pm 27.75	0.95
Management of breathlessness	78.33 \pm 25.11	0.95
Management of agitation	66.33 \pm 30.06	0.95
How well staff considered family needs	79.33 \pm 23.74	0.95
How well staff provided emotional support toward family	75.67 \pm 24.65	0.95
Coordination and teamwork by staff	76.00 \pm 24.47	0.95
Courtesy, respect, and compassion toward family	78.33 \pm 24.08	0.95
Skill and competence of intensive care unit nurses	78.33 \pm 23.37	0.95
Frequency of communication with intensive care unit nurses	73.33 \pm 27.06	0.95
Skill and competence of intensive care unit doctors	78.00 \pm 25.32	0.95
Atmosphere of intensive care unit	66.67 \pm 28.57	0.95
Atmosphere in the intensive care unit waiting room	35.33 \pm 34.41	0.95
Overall satisfaction with care	74.33 \pm 24.31	0.95
Cronbach's alpha for satisfaction with decision making		0.89
Frequency of communication	69.67 \pm 30.56	0.88
Ease of getting information	81.33 \pm 20.17	0.88
Understanding of information	79.33 \pm 21.50	0.88
Honesty of information	79.00 \pm 24.67	0.88
Completeness of information	76.67 \pm 23.37	0.88
Consistency of information	79.00 \pm 23.62	0.88
Included in decision making process	77.33 \pm 28.82	0.89
Support during decision making process	71.33 \pm 30.40	0.88
Control over the care of your family member	69.67 \pm 30.00	0.88
Adequate time to have your concerns and questions addressed	70.67 \pm 45.84	0.90

Table 4. Continued

Items	Mean \pm SD	Cronbach's alpha if item deleted
Hospital C		
Cronbach's alpha for satisfaction with care		0.94
Courtesy, respect, and compassion toward patient	79.35 \pm 22.12	0.94
Management of pain	77.72 \pm 22.07	0.93
Management of breathlessness	79.89 \pm 23.22	0.93
Management of agitation	69.29 \pm 30.81	0.94
How well staff considered family needs	83.97 \pm 19.11	0.94
How well staff provided emotional support toward family	75.82 \pm 26.84	0.93
Coordination and teamwork by staff	77.72 \pm 22.38	0.93
Courtesy, respect and compassion toward family	81.52 \pm 19.91	0.93
Skill and competence of intensive care unit nurses	82.61 \pm 19.87	0.93
Frequency of communication with intensive care unit nurses	80.71 \pm 21.96	0.94
Skill and competence of intensive care unit doctors	80.71 \pm 24.33	0.93
Atmosphere of intensive care unit	72.83 \pm 25.32	0.94
Atmosphere in the intensive care unit waiting room	35.60 \pm 34.62	0.95
Overall satisfaction with care	72.55 \pm 23.75	0.94
Cronbach's alpha for satisfaction with decision making		0.85
Frequency of communication	75.27 \pm 23.87	0.83
Ease of getting information	82.88 \pm 18.51	0.83
Understanding of information	83.15 \pm 20.00	0.82
Honesty of information	83.42 \pm 18.63	0.82
Completeness of information	84.24 \pm 19.51	0.83
Consistency of information	81.25 \pm 21.49	0.83
Included in decision making process	85.05 \pm 19.63	0.85
Support during decision making process	82.88 \pm 20.61	0.84
Control over the care of your family member	77.99 \pm 21.56	0.85

Values are expressed as mean \pm standard deviation (SD). Interpretation of scores: excellent = 100; very good = 75; good = 50; poor = 25, and very poor = 0; yes = 100, no = 0.

Table 5. Interrater reliability between family members

Variables	ICCs	p-value
Overall satisfaction with care	0.49	0.006
Overall satisfaction with information and decision making	0.64	<0.001

ICCs, intra-class correlation coefficients.

satisfaction with decision making. A study conducted by Stricker et al. [9], which involved cross-cultural adaptation of the FS-ICU-24 questionnaire, showed that the scale demonstrated construct validity for satisfaction with both care and decision making, but the Spearman's correlation coefficients were lower than those observed in this

study [9]. As shown in Table 5, the internal consistency (Cronbach's α) observed in our study was relatively high, indicating that the Korean version of the scale demonstrated good reliability. In a study of the Turkish version of the scale [8], the internal consistency for each item in the questionnaire ranged from 0.33 to 0.82. Regarding

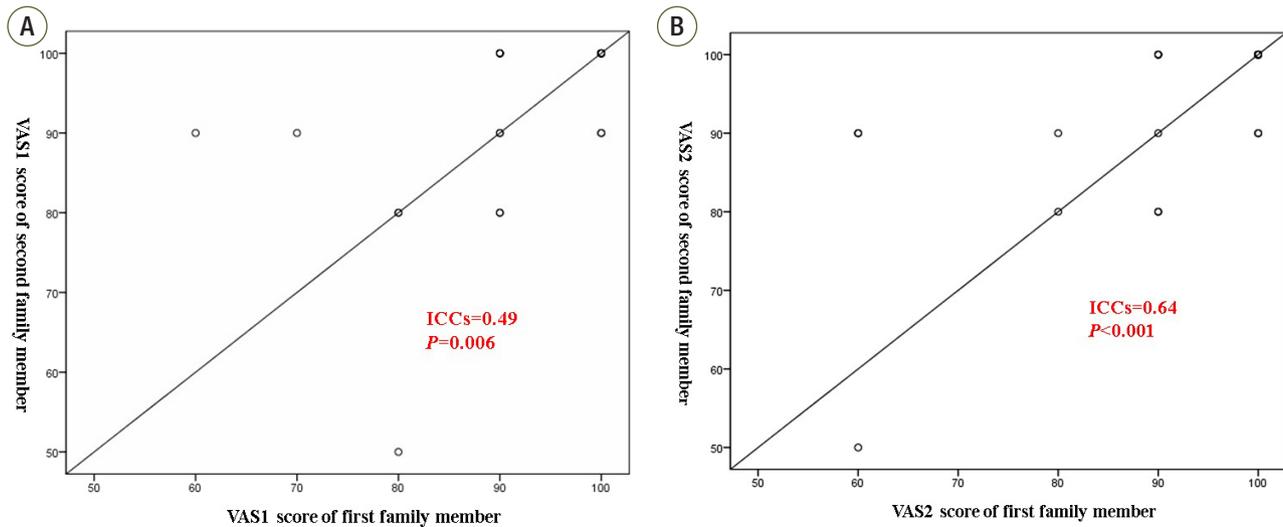


Figure 1. (A) Reliability of satisfaction with care. (B) Reliability of satisfaction with decision making. VAS: visual analog scale; ICC: intra-class correlation coefficient.

agreement in satisfaction between family members, we examined interrater reliability for 24 pairs of responses provided by two relatives of one ICU patient. In our study, while the level of agreement for satisfaction with decision making was adequate, this was not the case for satisfaction with care. A prior cultural adaptation study assessed both interrater and intrarater reliability and showed moderate agreement for satisfaction with care and fair agreement for satisfaction with decision making [9]. However, in our study, as the number of pairs of responses was relatively low and some family members provided disparate responses, this subscale analysis was not possible.

The average score of all items in our study was 75.44 ± 17.70 , and the mean scores for most items in the satisfaction with care and satisfaction with decision making subscales, with the exception of the “management of agitation,” “ICU atmosphere,” and “ICU waiting-room atmosphere” items, ranged from 75 to 85, and the score for the “ICU waiting-room atmosphere” item was lower than that for the other items. In contrast, in the Turkish version, the score for the “communication between nurses and family members” item was lower than those for the other items, which were above the average value of 0.70 [8].

The study was subject to some limitations. For in-

stance, responses were provided mainly by relatives of ICU survivors; therefore, the results could have been subject to selection bias. In addition, we used correlation between questionnaire and VAS scores to determine construct validity; however, the VAS was originally designed to measure quality of life or pain [17,18], and might not be an appropriate index for the measurement of satisfaction with care or decision making in family members of ICU patients. Nevertheless, considering that there is no gold standard for the assessment of satisfaction with ICU care, the VAS is one of the most useful instruments for use in assessing and comparing degrees of satisfaction and has been used in similar studies [17-19]. Moreover, as mentioned above, we evaluated inter-rater reliability, and the level of agreement for satisfaction with care was low. In addition, the number of pairs of responses was low and some participants’ responses were disparate; therefore, the ICC for satisfaction with overall care was also low. Furthermore, intra-rater reliability was not measured in the study.

In this study, the results indicated that the adapted version of the FS-ICU-24 questionnaire was valid and suitable for use with a Korean sample. Therefore, it could be a valuable tool for use by medical staff in assessing the family members’ satisfaction about ICU care in Korea.

Acknowledgements

This prospective survey study was conducted in accordance with the amended Declaration of Helsinki. The Institutional Review Board of Seoul National University Bundang Hospital approved the study protocol (IRB No. B-1410-272-005) and all participants provided written informed consent.

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Supplementary Materials

The online-only Supplement data is available with this article online: <https://doi.org/10.4266/kjccm.2016.00962>.

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