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Translation and validation of family satisfaction questionnaire of adult patients hospitalized in Intensive Care Units

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ABSTRACT

Aims:A standard tool is required to investigate and determine of family satisfaction level of adult patients hospitalized in Intensive Care Units (ICUs). Since such tools haven't been localized in Iran so far, the aim of this study was "translation and validation of family satisfaction questionnaire (FS-ICU34) of adult patients hospitalized".

Methods: This is a methodological study. Face and content validity process was carried out after translating English version of the tools through forward-backward translation technique, confirmed by WHO (World Health Organization), and exploratory factor analysis was conducted by investigating three hundred questionnaires completed by family members of adult patients hospitalized in ICUs of Tehran hospitals in order to investigate construct validity.

Results: In exploratory factor analysis, three subscales including: satisfaction with medical staff performance (12 items), comfort (12 items) and decision making (6 items) were determined by Eigen value above one and factor load above 0.5. Cronbach's alpha in the first, the second and the third subscale were respectively achieved; 0.93, 0.92 and 0.84 and Cronbach's alpha of the tools was achieved 0.95. In this study the number of the questions was decreased to thirty.

Conclusions: After performing procedures of determining validity, necessary changes in the number of the questions, writing and number of the questionnaire areas were carried out and it became clear that the Persian version of the questionnaire FS-ICU 34 benefits high reliability (α= 0.95). Removing some questions due to their low scores allocated by specialists' panel was done during the stages of determining validity and it was done among Iranian respondents due to cultural incompatibility. Content validity index of all the satisfaction Persian tools of family members of adult patients hospitalized in ICUs through two S-CVI/Ave and S-CVI/Universal validity methods were respectively achieved 0.97 and 0.86, which is indicating good validity of the Persian version of the tools. Also by shortening Persian version of the above tools, answering them would be easier.

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1. Introduction

Measuring patients' satisfaction is one of the most important and challenging components of investigating care quality. Most often we have problem with measuring patients ‘satisfaction in ICUs [1]. Most of the patients of these wards are not able to make decision and to explain their satisfaction since they are severely ill and they have low level of consciousness. They even may not remember critical care experience completely, which is very important in investigating patients' satisfaction [2]. Family satisfaction can be measured as a substitute for patients ‘satisfaction in these units [1]. In these cases patients' satisfaction may be determined through family members' awareness and understanding regardless of clinical outcomes. Patients' family is a part of taking care of the patients, also providing support for the patients' family can affect patients' improvement [1]. Improvement of care quality in ICUs requires measuring family satisfaction data [3].

Studies regarding family satisfaction in ICUs have been improved in recent decades and patient- and family-centered care approach has been taken into account [4]. Measuring family' satisfaction of the patients hospitalized in ICU requires standard and local tools. Such tools have not been prepared in Iran; therefore this study is done with the aim of localizing investigating tools of family members' satisfaction of the patients hospitalized in ICUs.

Several tools have been designed for measuring family satisfaction of the patients hospitalized in ICUs and these tools are being extensively used in other countries [5];among them the 34-item satisfaction questionnaire of the family members' satisfaction of the adult patients hospitalized in ICUs has been more comprehensive and includes all the areas related to the family requirements in a critical environment.

This study is done with the aim of achieving a Persian version of family members' satisfaction questionnaire of the adult patients hospitalized in ICUs and FS-ICU-34questionnaire has been used for this purpose.

2. Methods

This article is the result of a methodological study, which is done with the aim of translation, validation and studying regarding analysis of factor and reliability of the Persian version of the familysatisfaction tools of the adults patients hospitalized in ICUs. The number of all the samples for factor analysis was determined 300 of the patients' family members, this number was determined according to the number of the final questionnaire items (thirty items) and the ratio of one to ten and the samples were selected through convenient sampling [7]. Three hundred of the patients' family members were determined for investigating face validity, twenty six faculty members were determined for investigating content validity and four persons were determined for translating questionnaire.

In this study the Canadian version (the original one) of the satisfaction questionnaire of the patients' family hospitalized in ICUs (FS-ICU 34), which included 34 items was translated and validated. These tools include twocare subscales with 18 items and decision making with 16 items [8]. Initially aftercoordinationwith the Canadiandesigner of the tools (DrHilan), validation license in Persian version was achieved; then WHO forward-backward translation method was used for developing Persian version of family satisfaction questionnaire. Translation stages were as the following:

Forward translation: In this stage atranslator who was experienced in translating tools and experienced in health issues and English language whose native language was Persian translated the questionnaire from English to Persian. In this stage WHO translation principles such as: conceptual translation, using simple and clear sentences, avoiding specialized words, colloquialism, local terms and etc. were considered.

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Holding specialists' panel: Specialists' panel had been held for editing the translated version with the presence of two bilingual translators (Persian and English), a nurse with MA in nursing and experience of working in ICUs, a specialist in intensive care and an experienced methodologist in tools making;The differences between forward translation and the first version were discussed and necessary changes were applied. Thus, a Persian version was prepared in this stage.

Backward translation: In this stage the Persian version was translated to English by a translator whose native language was English and was fluent in Persian. The disputed issues of the above translation were discussed in the Experts panel.

Pre-test stage: In this stage, the questionnaire was completed through in- depth interview method with twenty men and women who were older than 18 years old and they were relatives of the patients hospitalized in ICUs; some changes were applied in the items according to the respondents' understanding of the questions and the selected answers. In this regard the translated version was prepared and the questionnaire validation was done according to the method described below.

Quantitative and qualitative face validity and content validity were determined qualitatively and Content Validity Ratio (CVR) and Content Validity Index (CVI) were adjusted in two specialized and statistic panels and Kappa was calculated for every item.

Exploratory Factor analysis was used for achieving experimental validity and doing construct validity, andsince there is not exclusively one general factor considered in the structure of the test of the study, varimax and factor rotation was used in this regard [9].

The tools internal reliability was determined by Cronbach's alpha (or alpha coefficient) and split-half method. Test-retest method was not applied in this study because we could not have access to the samples again [10].

Inclusion criteria in terms of determining construct validity and tools reliability included: willingness to participate in the study, hospitalized patients should be older than 18 years old, passing at least 48 hours of admission in ICU, the presence of the patient's family members including close relatives and those who make decision for the patient such as: spouse, father, mother, sister , brother and his/ her children if not other patient's relatives, visiting the patient at least two times in ICU, participants of the study should be 18 to 65 years old, they should be able to read and write and they should not suffer from any obvious mental illness before entering the study, the possibility of communicating with them according to their different culture or accent and exclusion criterion was lack of patient's family members' willingness to continue the study.

Written satisfaction was taken from all the participants; they could stop their cooperation during the study and the results of the study were given to them if they liked.

3. Results

Forward-backward translation method which is confirmed by WHO was used for translating the family satisfaction 34-item questionnaire, this translation method has been introduced as the international method of conceptual translation in Medicine [11].

In this method, at first the English version of family satisfaction34-item questionnaire was translated to Persian according to the forward-backward translation stages and the first Persian version of the tools was developed with 40 items. Some questions were added in the translation stage because of six extra questions (three questions about the patients who were dead and three open response questions).

Face qualitative validity was achieved through face-to-face interview with ten respondents (patients' family members) and difficulty,suitabilityand ambiguity level were investigated. Face quantitative validity was achieved by determining impact item. Impact item coefficient was achieved above 1.5 for all the items in this stage.

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Table 1: CVI and CVR of the Persian version item of the family members of the patients hospitalized in ICU

No	Tools items	CVR	I-CVI 1	I-CVI 2	PC	K*	Results of CVR	Results of CVI
1	Courtesy and respect to the patient	1	0.8	1	0.015	1	Acceptable	Perfect
2	Empathy (compassionate care)	0.8	0.8	1	0.015	1	Acceptable	Perfect
3	Relieving pain	1	0.8	1	0.015	1	Acceptable	Perfect
4	Reducing dyspnea	1	0.9	1	0.015	1	Acceptable	Perfect
5	Reducing turmoil (such as anxiety, stress)	1	0.8	1	0.015	1	Acceptable	Perfect
6	Meeting needs	0.8	0.8	1	0.015	1	Acceptable	Perfect
7	The level of emotional support	1	0.9	1	0.015	1	Acceptable	Perfect
8	Providing your spiritual-religious needs	1	0.9	1	0.015	1	Acceptable	Perfect
9	The medical staff collaboration	1	0.8	1	0.015	1	Acceptable	Perfect
10	Courtesy and respect to the family members	0.8	1	1	0.015	1	Acceptable	Perfect
11	Skill and proficiency of nurses	0.8	0.8	0.83	0.093	0.81	Acceptable	Perfect
12	Communication of nurses with family members	1	0.8	1	0.015	1	Acceptable	Perfect
13	Proficiency of physicians	0.8	0.8	0.83	0.093	0.81	Acceptable	Perfect
14	Communication of physicians with family members	1	0.8	1	0.015	1	Acceptable	Perfect
15	Assistanceofsocial workerstofamily members	0.8	0.8	1	0.015	1	Acceptable	Perfect
16	Assistance of Clergymentofamily members	0.2	-	-	-		Not acceptable	Removed
17	ICUs appearance	1	1	1	0.015	1	Acceptable	Perfect
18	Waiting room appearance	1	0.8	1	0.015	1	Acceptable	Perfect
19	Total family members' satisfaction of experiencing ICUs	1	0.8	1	0.015	1	Acceptable	Perfect
20	ICUs medical staff willingness to answer questions	1	1	1	0.015	1	Acceptable	Perfect

In the qualitative stage of content validity, item one was divided into two items according to the agreement of most of the specialists; "behaving with courtesy, respect and compassion to patient" was divided "behaving with courtesy and respect to patient" and "behaving with compassion to patient". After this stage the number of the tools questions was increased to 41 questions.

CVR was calculated in the next stage and five questions were removed due to achieving low score (questions number 16,24,32,33 and 36).Questions 39, 40 and 41 were open response questions; they were removed according to the specialists' view due to impossibility of testing construct validity and due to shortening tools.

According to "Polit and Bak's" recommendation based on performing two rounds in determining CVI (in the case of significant need to providing specialized panel views), determining this index has been done in two stages in this study due to many reform recommendations in the first round [12]. Question 37 was removed in the first round and questions 29 and 32 were removed in the second round and the above questionnaire has become a 30-item tool [14]. CVIof the tools (S-CVI/Ave) was achieved 0.97 in this study,and S-CVI/Universal was reported 0.86. (Table 1)

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Table 1: CVI and CVR of the Persian version item of the family members of the patients hospitalized in ICU (continue)

No	Tools items	CVR	I-CVI 1	I-CVI 2	PC	K*	Results of CVR	Results of CVI
21	Comprehensibility of medical staff explanations	1	0.8	1	0.015	1	Acceptable	Perfect
22	Accuracy of the given information	0.8	0.8	1	0.015	1	Acceptable	Perfect
23	How good the medical staff give information to family members	0.8	0.8	1	0.015	1	Acceptable	Perfect
24	The level of similarity of medical staff's explanations	0.6	-	-	-	-	Not acceptable	Removed
25	Sense ofparticipation in thedecision-making process	0.8	0.9	1	0.015	1	Acceptable	Perfect
26	Participation in thedecision-making processat the right time	0.8	0.9	1	0.015	1	Acceptable	Perfect
27	Getting enoughinformationto participate in thedecision-making process	1	0.8	1	0.015	1	Acceptable	Perfect
28	Enough time to think about information	1	0.8	1	0.015	1	Acceptable	Perfect
29	Being supported by medical staff during decision making process	1	0.8	1	0.015	1	Acceptable	Perfect
30	Participationin the process ofpatient care	0.8	0.9	0.83	0.093	0.81	Acceptable	Perfect
31	Being hopeful for patient's improvement	0.8	0.8	0.5	0.312	0.22	Acceptable	Removed
32	Family members' agreement about treatment and care procedure	0.6	-	-	-	-	Not acceptable	Removed
33	Enough time for investigating concerns during decision making	0.6	-	-	-	-	Not acceptable	Removed
34	Satisfaction of the patient care	1	0.9	1	0.015	1	Acceptable	Perfect
35	Total satisfaction of the family members in terms of their role in making decision in taking care of their patient	0.8	0.8	0.83	0.093	0.81	Acceptable	Perfect
36	Family members' view in the case of patient's death	0.4	-	-	-	-	Not acceptable	Removed
37	Your view about patient's convenience in the last hours of his/her life	1	0.6	-	-	-	Acceptable	Removed
38	Description of family member' view in the last hours before patient's death	1	0.8	0.5	0.312	0.22	Acceptable	Removed
39	Suggestions about providing better care	1	0.8	0.83	0.093	0.81	Acceptable	Removed
40	Family members recommendation in the case of medical team inappropriate performance	0.8	0.8	0.83	0.093	0.81	Acceptable	Removed
41	Family members' recommendation about providing better services by the medical team	0.8	0.8	0.83	0.093	0.81	Acceptable	Removed

S-CVI/Universal=0.86, S-CVI/Average=0.97

CVR,Content Validity Ratio; CVI, Content Validity Index;pc, probability of a chance occurrence; S-CVI,Scale Content Validity Index, S-CVI/U;Scale Content Validity Index/ Universal ;S-CVI/A,Scale Content Validity Index/ Average,K*;modified kappa statistic.

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After developing final tools, exploratory factor analysis method was used to determine construct validity. The number of the samples was determined according to the number of the wards and ICU beds of every hospital. The questionnaires were completed in self-report form.

In this study the average age of the participants was 36.13±10.76 years old. Data description can be observedin table 2.

KMO (Kaiser-Meyer-Olkin) method and Bartlett's test have been used in analysis factor in order to measure sampling adequacy; KMO was 0.952 and the result of Bartlet test was 5972.497 with freedom degree of 435 and p=0.000sampling adequacy was significant, which was indicating that the data was appropriate for factor analysis (Table 3).

Table 2: Personal information of the family members of the patients hospitalized in ICU

Personal information frequency (n=300)	Percent	frequency
Gender		
Male	137	54.3%
Female	163	45.7%
The relationship of the family members with the hospitalized patient		
Wife	16	5.3%
Husband	8	2.7%
Mother	17	5.7%
Sister	57	16%
Brother	44	14.7%
Daughter	48	16%
Son	30	10%
Other	61	3.20%
Previous history of hospitalization of one of the family members in ICUs		
Yes	95	31.7%
No	205	68.3%
Living with the patient		
Yes	106	35.3%
No	194	64.7%
The times that the patient and family members used to meet each other before hospitalization		
More than one time a week	61	20.3%
Weekly	16	25.3%
Monthly	34	11.3%
Annually	17	5.7%
Less than one time a year	5	1.7%
I don't remember	107	35%
The place where patient's family members live		
Out of the city that hospital is located	106	35.3%
In the city that hospital is located	193	64.3%

Table 3: Results of sampling adequacy test

The results of sampling adequacy test	
The adequacy of KMO sample size	0.952
SphericityBartlet test	5972.497
Freedom degree	435
Significant	0.000

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Principle components analysis method was used to extract factors from analysis factor; the three numbers was determined with Eigen value above one and factor load above 0.5.

Table 4: Chronbach's alpha coefficient in total scale and subscales of the Persian version of the family ' satisfaction questionnaire of the patients hospitalized in ICU

Subscale	Number of the items	Chronbach's alpha coefficient	Split-half internal correlation
Satisfaction of the medical team performance	12	0.93	0.81
Convenience	12	0.92	0.83
Decision making	6	0.84	0.84
All the tools	30	0.95	0.76

Table 5: The final rotated matrix of the components

	Dimensions		
Items	1	2	3
4	0.797		
3	0.790		
13	0.750		
5	0.747		
2	0.720		
11	0.694		
14	0.683		
9	0.671		
1	0.600		
10	0.582	0.502	
21	0.548		
22	0.509		
18		0.712	
19		0.702	
29		0.696	
8		0.694	
16		0.694	
7		0.650	
30		0.642	
12		0.621	
6		0.620	
20		0.611	
17		0.587	
15		0.531	
24			0.789
23			0.789
27			0.777
28			0.770
25			0.656
26			0.501

Eigen values were considered above 1.00 and Varimax rotation was carried out.

Screen plot was used to determine the number of the factors and the number of the factors of Questions of Persian version of family members' satisfaction of adult patients hospitalized in ICUs were categorized in three subscales including medical staff, convenience and decision making.

Item 10 "behavior of ICUs medical staff in terms of politeness" had two factor loads in the first factor; this item was not removed because of its close relationship with other items in this factor. After drawing screen graph and according to the appeared categories, factor analysis was done based on the above method and by determining three factors (with Eigen value above 1) and calculating factors, which had more than 0.5 loads. Cronbach's alpha coefficient in the total scale and the Persian version subscales of the family satisfactionquestionnaire of the patients hospitalized in ICU is reported in table 4.

Number of the questions of every one of the subscales and the factor load of every variable is on table 5.

4. Discussion

Family satisfaction is one of the important criteria in investigating care quality in ICUs [11, 13-15].

Measuring family members' satisfaction of the patients hospitalized in ICU is important since most of the ICU patients can't make decision about their care; also investigating patients' family members' satisfaction can help the improvement procedure of services, cares and provided treatments. This questionnaire is translated to other languages (English,

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Germany, Chinese, Portuguese, Spanish, French, Swiss, Hebrew and Arabic) with its 34-question form and its short form has been used in some other countries too [16].

The aim of this study is localizing the measurement tools questionnaire of family members' satisfaction of adult patients hospitalized in ICUs (FSICU-34).The 34-item family members' satisfaction questionnaire (FS ICU-34) was changed to 40 items after translating the tools; it was done because of considering six questions in the main questionnaire out of the structure of the main 34questions.The number of the questions has been increased to 41 after the end of content validity quality stage. One question was added since for answering one of these questions, it was necessary to be separated to two questions in Persian. After completing CVR stages and performing CVI specialists' panel two rounds (the first round under the supervision of ten specialists and the second round under the supervision of six specialists) and calculating Kappa statistical test, eleven items were removed and the number of the items of the Persian version of this questionnaire was determined thirty ones.

Totally 11 items (16, 24, 31, 32, 33, 36, 37, 38, 39, 40, 41) have been removed from the Persian version after CVR, the first panel of CVI and the second panel of CVI. It is while there was no change in the study of Stikeret al. in the number of the items during localizing process [17]. But in the study of Richard et al., which was done with the aim of re-scoring and decreasing the number of the questions, the number of the items was decreased from 34 to 24 after performing validity stages [18]. The removed items of this study were in consistent with items 15, 30 and 31, which were removed in our study.

Decreasing questions of the questionnaire, using short untreatable sentences for the Iranian respondents cause feasibility of answering the questions. In the present study, the time of answering the questionnaire was 15 minutes on average, which is indicating the feasibility of answering this questionnaire (less than 30 minutes).

German version of this questionnaire was feasible to answer too due to decrease of 10 questions [17].

In Canadian version of this questionnaire (34 items) two main methodological areas including: care satisfaction and decision satisfaction were recognized [19, 20]. It is while the questions were categorized in three areas in the present study. Considering that the procedure of changes has been achieved in the process of translation andface and content validity, it was expected to observe some changes in the Persian version of the questionnaire. The achieved areas of the present study include: medical staff's performance satisfaction, convenience and decision making of the family members. In this study CVI of tools (S-CVI/Ave) was 0.97. Also S-CVI/Universal has been reported 0.86; according to tools making resources, the amounts above 0.8 indicate appropriate content validity for all the tools [12].

This study shows that the Persian version of FS ICU questionnaire benefits high validity and its internal reliability with Chronbach's alpha of all the questionnaire was α=0.95 and with split-half technique was r=0.76; these numbers for subscales one, two and three were respectively α=0.93 and r=0.8, α=0.92 and r=0.83and α=0.84 and r=0.75. It is recommended to measure the sensitivity ofthe Persian version ofthe questionnaire by conducting future projects and doing clinical trials.

5. Conclusions

After performing the procedures of determining validity, necessary changes have been applied in the number, writing and the number of the questionnaire areas and it was determined that the Persian version of FS-ICU 34 questionnaire benefits high reliability. Finally FS ICU tools were designed with decrease of the number of the items and

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increase of the number of the dimensions in the 30-question Persian version and it included three dimensions including; family members' satisfaction with medical staff's performance, convenience and decision making. Among the 360 distributed questionnaires, 300 questionnaires were returned (82%). The average time of completing the questionnaire was determined 15 minutes, which is indicating the feasibility of using this questionnaire. Considering that the 30-item tools of family members' satisfaction of adult patients hospitalized in Persian ICUs benefits high reliability and validity and due to decreased number of the questions in compare with the main version, appropriate required time for answering the questionnaire, it benefits good feasibility level too.

Among the strong points of this study, it can be pointed out to high accuracy in using forward-backward method of translation confirmed by WHO by using Persian and English translators who were fluent in the second language in order to prepare a fluent Persian version, which is according to the main version by trying to be depositary in translation and doing content validity procedure with high accuracy and using an experience team including; nurses with experience of working in ICUs, nursing lecturers, Anesthetists specialists who were working in ICUs, methodologist specialists who had the experience of designingquestionnaire and some members of the patients' family and also calculating Kappa statistic, S-CVI/Ave, and S-CVI/Universal.

It is recommended to use these tools in ICUs in order to promote quality performance of ICUs andto investigate and monitor provided services. From the other side, using these tools provides an appropriate situation for investigating interventions and determining relatives' satisfaction level of the patients hospitalized in ICUs and consequently it can cause satisfaction of the patients hospitalized in these wardsand then, it leads to implementation of clinical trials.

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