

Developing a Tool for Evaluation of Causes of Futile Care in Intensive Care Units

Abstract

Background: In Iran, futile care has become a challenge for intensive care nurses. The aim of the study was to develop a tool for assessing the reasons of futile care at intensive care units (ICUs). **Materials and Methods:** A sequential mixed method in three stages was applied. In the first stage, a phenomenological study was performed with van Manen's method by interviewing 25 nurses at ICUs of 11 hospitals in Qazvin. To extract the items of the tool in the second stage, the concept of futile care in ICUs and its reasons were defined. Ultimately, the psychometric properties of the questionnaire were evaluated with face validity, content validity (quantitative and qualitative), construct validity (exploratory factor analysis), internal consistency (Cronbach's alpha), and test-retest reliability. **Results:** The initial tool had 119 questions. After validation, 39 items remained in the final questionnaire. Five extracted factors were as follows: professional competence (14 items), organizational policy (9 items), socio-cultural factors (7 items), personal beliefs and values (4 items), and legal issues (5 items). Cronbach's alpha for the whole questionnaire was 0.91 (range: 0.71–0.96). The test-retest reliability was 0.87 ($p < 0.001$). **Conclusions:** Nursing managers and clinical nurses can use this tool to identify the causes of futile care and reduce it in their clinical settings. Policy makers can use this tool for improving the management of ICUs.

Keywords: Intensive care unit, medical futility, nurses, psychometric

Introduction

The expression "futile care" was initially defined in 1980 and entered to medical ethics text books in 1990.^[1] Its definition differs based on the patients' conditions and the nurses' personal values.^[2] Some nurses define futile care based on the quality of life after survival.^[3] Moreover, the definition of futile care depends on the individual's perception of the quality and quantity of life, moral beliefs, and judgment regarding successful and unsuccessful treatment.^[4]

A considerable proportion of resources are allocated to futile care in intensive care units (ICUs).^[5] Some studies state that 40–60% of care in ICUs is futile.^[2] In addition, 84% of Canadian physicians and 95% of nurses believe that futile care is given at least once every year. Studies show that the positive effect of futile care is <10%, but it is given because physicians are more worried due to involvement in legal issues than costs imposed on insurance companies.^[6]

Nurses provide futile care for several reasons including feeling responsible for the patient, feeling hopeless in responding to the patients' needs, and being worried about excessive use of invasive intervention at the end of life. The insistence of family on futile care is the main reason for continuation of such care at ICUs. Various social, professional, organizational, and personal reasons are also involved in giving futile care.^[2]

As stated by some nurses, lack of skillful and scheduled communication with patient's family and disagreement between healthcare team are the reasons of futile care. Nurses believe that the issue of futile care can be solved by improving the communication with patient's family and spending time with them in order to accept the existing reality.^[7,8] Based on our literature review, there has been no tool for assessing the concept of futile care and its reasons. Considering the importance of this issue in providing better healthcare services in ICUs, the study aimed to design and validate a suitable tool regarding the reasons of futile care at ICUs.

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Access this article online

Website: www.ijnmrjournal.net

DOI: 10.4103/ijnmr.IJNMR_146_17

Quick Response Code:



How to cite this article: Yekefallah L, Ashktorab T, Manoochehri H, Majd HA. Developing a tool for evaluation of causes of futile care in intensive care units. Iranian J Nursing Midwifery Res 2019;24:56-60.

Received: October, 2017. **Accepted:** August, 2018.

Materials and Methods

This sequential mixed-method study was conducted from 2014 to 2015 in Qazvin province, Iran. In the first stage and for item extraction to develop questions, the concept of futile care and its reasons at ICUs were defined with a hermeneutic phenomenological study according to van Manen's approach.^[9] Participants selected with purposive sampling were 25 ICU nurses in 11 hospitals. They had bachelor degree with at least 1 year experience at ICU. Data were collected with semi-structured interviews.

Analyzing live experiences of the participants after transcribing the interviews verbatim and using field notes, we extracted the questions of the tool regarding the causes of futile care at ICUs in the second stage. Comprehensiveness of the items was checked and confirmed with the literature review. The inductive-deductive approach was applied to form the questions. The third stage comprised the evaluation of psychometric properties of the questionnaire with face validity, content validity (quantitative and qualitative), construct validity (exploratory factor analysis), internal consistency (Cronbach's alpha), and stability (test-retest reliability).

For face validity, both qualitative and quantitative methods were used. In the qualitative method, the level of difficulty in understanding terms, the mismatch, and confusion of items leading to misconception were examined.^[10] The questionnaire was also evaluated and checked in terms of its prose, wording, and logical as well as attractive appearance based on the opinions of experts. After correcting the tool with these criteria, the quantitative method including item impact was used to omit unsuitable items and determine the importance of each item.^[11]

To assess the impact of each item, a 5-point Likert scale including very important (score 5), important to some extent (score 4), moderately important (score 3), a little important (score 2), and not important at all (score 1) was used. The scale was given to 10 ICU nurses (other than nurses in previous steps) and they were asked to check the importance of each item based on their personal experience. Through qualitative and quantitative face validity, items with vagueness and impact score <1.5 were deleted.^[10,11]

Content validity was evaluated with Waltz-Basel validity index by 15 faculty members and ICU nurses. Initially, the "relatedness" of each item was assessed based on four scores (1-4). If content validity index (CVI) of an item was measured ≥ 0.79 , it was saved; if it was between 0.70 to 0.79, the item was modified; and items with CVI <0.70 were deleted.^[12] According to the index, the "clarity" and "simplicity" of the items were also assessed. We also assessed content validity according to the Lawshe's table. Accordingly, the 15 faculty members and ICU nurses were asked about the necessity of each item on a 3-point

Likert scale (3 = necessary, 2 = useful but unnecessary, and 1 = unnecessary).

Ultimately, the content validity of the items was calculated.^[13] According to the Lawshe's table, the least acceptable value was 0.49 and items with higher values were saved and those with lower values were deleted.^[13] It should be noted that the score obtained after calculating the content validity ratio (CVR) was compared to the index in Lawshe's table. If the number was higher than the number in the table, the item was considered necessary and important and was statistically significant ($p < 0.05$).^[13]

For construct validity (factor analysis) and reliability, all eligible nurses at all general hospitals with ICU in Qazvin province were selected. Therefore, 210 nurses were then completed the questionnaire after giving their written informed consent. Before factor analysis, the Kaiser-Meyer-Olson (KMO) index was used to assess sampling adequacy. Then, cumulative variance, eigenvalue, and varimax rotation were used to determine the nature and number of factors.

To determine the number of items related to each factor, factor loading was calculated.^[14] The cut-off point for each factor load varies in different studies^[15] and was 0.3 in this research. To assess the reliability of the tool, its internal consistency was verified with Cronbach's alpha and test-retest method. To identify correlation between the factors by test-retest, intra-class correlation coefficients were calculated for each factor and the whole questionnaire.

Ethical considerations

The necessary approvals were obtained from the Shahid Beheshti Medical University, Qazvin Medical University, and ethical committee. The participants were informed about the aims of this study and the interviews were recorded after their permission and written informed consents. During the interviews, the names of the participants were deleted and replaced with codes. The participants' beliefs and values were respected at all stages of the study. Moreover, they were assured that their information would remain confidential and that they could leave the study at any time.

Results

In qualitative phase, 25 nurses (21 women and 4 men) aged from 27 to 45 years with mean experience of 9.84 years and bachelor or master degrees were interviewed. Their mean experience at ICU was 7.14 years. In phenomenological analysis, the themes related to the causes of futile care and their different aspects were identified based on their experiences. Three themes emerged from the data were as follows: 1 – personal belief and value, 2 – policy of institute, and 3 – socio-cultural factors.

At the end of this phase, the initial questionnaire was developed with 119 items. A literature review was performed to add any possible question to the tool; however, no item was found for this purpose. Then, the items were assessed by the research team to insure their accuracy. Some items with overlapping or repetitive content were omitted. Moreover, some items were merged and some were modified and ultimately, 79 items remained. Then, 11 items were deleted after qualitative and quantitative face validity.

To determine CVR, 15 faculty members were asked to rate the necessity of each item and according to their opinions as well as Lawshe's table,^[13] items with a score <0.46 were deleted. At the end of this phase, 57 items remained. To determine the CVI of the tool, the percentage of nurses who gave scores 3 and 4 for relatedness, clarity, and simplicity of items was calculated and the index was computed 0.89.^[16] Then, the modified questionnaire was presented to several nurses and their opinions were asked in terms of comprehensiveness, clarity, and simplicity of the items. At this stage, 16 items were deleted and 41 items remained.

For construct validity (exploratory factor analysis by alpha method), the tool was completed by 210 ICU nurses [Table 1]. Before factor analysis, the KMO index was calculated to find the adequacy of sampling (KMO = 0.83). By evaluating the table of variances, about 48% of cumulative variance [Table 2] was predicted by the initial five factors with an eigenvalue >1 [Figure 1]. The first factor explained 13.10% of the variance followed by 10.60%, 10.10%, 6.90%, and 6.80% by the second to fifth factors. At the end of this phase 2 items (number of 5 and 26) were deleted based on research team opinion (four faculty members of nursing and research expert).

In general, 39 items loaded on five factors and these five factors defined 48% of the total variance. In this study, cut-off point for factor loading was 0.30.

The five extracted factors were as follows: professional competence (14 items), organizational policy (9 items), socio-cultural factors (7 items), personal beliefs and values (4 items), and legal issues (5 items). Totally, the questionnaire consisted of 39 items. After determining the items and performing factor analysis, Cronbach's alpha was calculated for each factor and the whole tool. The total alpha was 0.91 ranging from 0.71 to 0.96 in the subscales, indicating a suitable internal consistency [Table 3].

Reliability was assessed with test-retest method. Twenty nurses were asked to complete the questionnaire two times in a 2-week interval.^[17] The intra-class correlation coefficient was calculated with the SPSS (ver: 20) [Table 3]. The test-retest correlation coefficient was 0.87 for the whole tool ($p < 0.001$), showing desirable reliability.

Scores are obtained on a 5-point Likert scale from 1 to 5 as follows: completely disagree = 1, disagree = 2, neutral = 3,

Table 1: The sociodemographic characteristics of the participants in the construct validity phase

Variable	Range	Mean (SD)
Age (years)	22-50	32.46 (5.62)
Work experience (years)	1-25	9.10 (5.28)
Work experience at intensive units (years)	1-20	5.47 (4.25)
Work experience at ICUs (years)	0.5-20	4.70 (3.79)
Mean hours of mandatory overtime	30-200	35.48 (22.10)

SD: Standard deviation; ICUs: Intensive Care Units

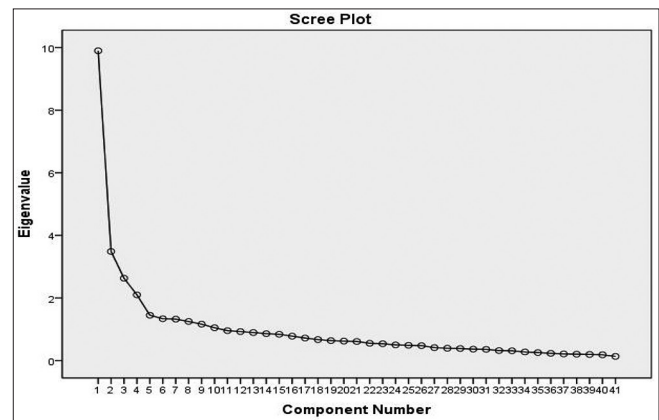


Figure 1: Scree Plot of explanatory factors

agree = 4, and completely agree = 5. There are no reverse items in the questionnaire and the range of scores is from 39 to 195. Higher scores indicate diverse reasons for futile care.

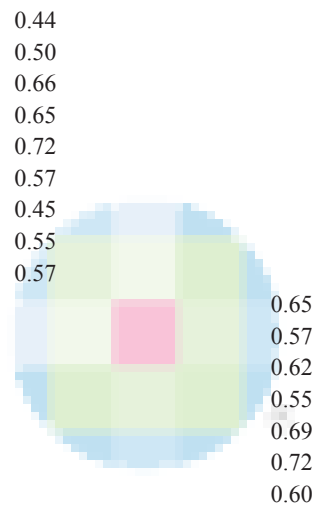
Discussion

The "Questionnaire for Causes of Futile Care in ICU" has 39 items in five factors. The validity and reliability of the questionnaire were desirable. Inductive-deductive approach was used in developing the tool. Following item extraction from the interviews, no new item was added from the literature review. Construct validity revealed five factors were as follows: professional competence (14 items), organizational policy (9 items), socio-cultural factors (7 items), personal beliefs and values (4 items), and legal issues (5 items). Cronbach's alpha for the tool was 0.91 ranging from 0.77 to 0.87 in the factors, showing a suitable internal consistency.

We found nothing in the literature to assess the causes of futile care in ICU. The closest tool was the "nurses' perceptions of end-of-life care" that was introduced by Hansen in 2009 with 30 items.^[18] This tool has five factors, namely knowledge and ability, work environment, support for staff, support for patients and patients' families, and stress related to specific work situations in the context of end-of-life care. A higher score shows more negative perception. The knowledge and ability factor in Hansen's tool corresponds with the professional competency and the work environment factors in our questionnaire, and support

Table 2: Exploratory factor analysis (rotated component matrix)

Items (item number)	Component					
	1. Professional competency (14)	2. Organizational policy (9)	3. Sociocultural factors (7)	4. Personal beliefs and values (4)	5. Legal issues (5)	
1	0.54					
2	0.59					
3	0.68					
4	0.62					
5	0.57					
6	0.64					
7	0.54					
8	0.63					
9	0.41					
10	0.53					
11	0.62					
12	0.56					
13	0.55					
14	0.43					
15		0.44				
16		0.50				
17		0.66				
18		0.65				
19		0.72				
20		0.57				
21		0.45				
22		0.55				
23		0.57				
24				0.65		
25				0.57		
26				0.62		
27				0.55		
28				0.69		
29				0.72		
30				0.60		
31					0.73	
32					0.82	
33					0.74	
34					0.66	
35						0.71
36						0.34
37						0.70
38						0.60
39						0.47



for staff as well as work-related stress factors correspond with our organizational policy factor. Finally, support for patients and patients’ families’ factor corresponds with socio-cultural factors in our tool.

The second tool similar to our questionnaire is the “Withdrawal of Treatment in the ICU” developed by Jensen and colleagues (2012) that can be used for ICU nurses and general practitioners.^[19] The important point regarding this tool is its relation to decision-making process for withdrawal of treatments which is in contrast with the religious and ethical guidelines in Iran.

Since generalization is limited in qualitative research, we cannot generalize our results to the whole country because we only interviewed nurses in Qazvin.

Conclusion

Nursing managers and clinical nurses can apply this tool to identify the causes of futile care. In addition, nurses can modify their communication with the patients’ families in order to reduce futile care. Moreover, policy makers in the Ministry of Health can use it to improve management in ICUs, reduce treatment costs, and design a modern

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Table 3: Cronbach's alpha for the instrument and re-test correlation coefficients

Factors	Cronbach's alpha (n=210)	Intra-class coefficients
Professional competency	0.82	0.82
Organizational policy	0.87	0.87
Sociocultural factors	0.96	0.96
Personal beliefs and values	0.71	0.70
Legal issues	0.90	0.90
Total inventory	0.91	0.87
<i>p</i>	<0.001	

nursing program. The quality of health care would improve markedly by such policies in the country. On the other hand, the results of this study may facilitate other qualitative studies to reduce futile care by physicians and nurses. This tool can enhance end-of-life care in patients admitted to ICU. Since, in Iran, there are no clear guidelines on the instances and boundaries of futile care for physicians and the medical team, developing such guidelines is necessary for decision-making regarding futile care.

Acknowledgments

This study was part of a dissertation that approved by the Institutional Review Board (IRB) with approval number 870, in international branch of Shahid Beheshti University of Medical Science. We would like to thank the vice chancellor for research affairs of the international branch of the Shahid Beheshti University of Medical Sciences, and all the participants of this study.

Financial support and sponsorship

Shahid Beheshti University of Medical Sciences

Conflicts of interest

Nothing to declare.

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