Factorial Structure of Nursing Practices Related to Support for Decision-Making Regarding Consent for Surgery in Elderly Patients with Dementia

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ABSTRACT

Background   When elderly patients with dementia require highly invasive treatment or surgery for life-threatening conditions, decisions regarding consent for surgery are made based on informed consent provided by the family, which excludes the patient whose decision-making ability is deemed impaired due to the dementia.

This study aimed to clarify the factorial structure of nursing practices related to support for decision-making regarding consent for surgery in elderly patients with dementia.

Methods   An anonymous self-administered questionnaire survey was completed by nurses with three or more years of experience working in orthopedic surgery wards at secondary emergency hospitals in the Kinki area.

The survey collected data on participant attributes and nursing practices related to decision-making support. Data were analyzed by exploratory factor analysis (promax rotation) using nursing practice items related to decision-making support as variables. Internal consistency was examined.

Results   Participants were 112 nurses including 108 women (96.4%) and four men (3.6%), with a mean age of 38.3 (±SD 9.8) years. Exploratory factor analysis of the nursing practice items related to decision-making support demonstrated the validity of the observed 24 variables, with a Kaiser-Meyer-Olkin value of 0.858 and a significant Bartlett's test of sphericity ($P < 0.001$). Five components with eigenvalues of 1 or more were extracted, including "achieving advocacy for elderly patients with dementia through cooperation among medical professionals," "advice considering the lifestyles and values of patients and their families," "support with a deeper understanding of elderly patients with dementia," "support that helps elderly patients with dementia to express their intentions," and "nurses' attendance in IC sessions for elderly patients with dementia." The Cronbach's α coefficient for the 24 nursing practice items related to decision-making support was high, at 0.926.

Conclusion   The factorial structure of nursing practice related to support for decision-making regarding consent for surgery in elderly patients with dementia included five factors and 24 items. The reliability and construct validity of the factorial structure were also confirmed.

Key words   consent for surgery; decision-making support; elderly patients with dementia; nursing practice

In Japan, where super-aging of society is progressing, the number of elderly patients with dementia[1] is projected to reach seven million by 2025. Elderly patients with dementia face a high fall risk, and those who fall or suffer a fracture are transported to a secondary emergency hospital. The femoral neck and greater trochanter are common sites for fracture, for which surgery is the first treatment option and hospitalization is required. As written consent is necessary for surgery, the need for nursing assistance is likely to be high among elderly patients with dementia who face decision-making about providing consent to undergo surgery. However, when elderly patients with dementia fall into a life-threatening state and the need for a highly invasive treatment or surgery arises, decisions regarding consent for surgery are made solely based on informed consent (IC) provided by the family, as the patient is considered to lack decision-making ability due to dementia.[2] Thus, under the present circumstances, the lives of elderly patients with dementia are dependent on the value systems of their families or medical professionals. Consequently, some cases might not even receive the necessary medical care.

The process of decision-making regarding consent for surgery involves a legal procedure of obtaining a signed consent form.[3] as surgical procedures—provided to treat disease—can be highly invasive and/or directly affect the lives of patients. However, in some cases, patients are unable to make decisions themselves about

giving consent. While the "Practice Guidelines for Process of Decision-Making Regarding Treatment in End-of-Life Care"[4] lay out the ideal scenario for these instances, providing decision-making support to elderly patients with dementia in a way that encourages patient understanding through creative measures according to disease severity (i.e., cognitive dysfunction), or that which allows medical professionals to draw out the patient's feelings patiently, may be difficult given the current environment, in which shorter acute ward hospitalization is encouraged in line with recent medical system reforms.

Of all medical professionals, nurses work the closest with patients. As such, they are required to provide support to ensure the best possible medical and nursing care for patients, while also protecting the rights of those who have difficulty making decisions for themselves due to decreased cognitive function. In 2016, revisions to medical fees were made in order to address issues related to elderly dementia care in acute wards. New fees introduced include additional fees for dementia care to evaluate care for patients with dementia who suffer from physical disorders. Efforts to plan, implement, and evaluate environmental adjustment and communication methods have also been made on a regular basis to prevent deterioration and facilitate smooth treatment through team-based collaboration.

According to Narimoto et al., nurses serve as the critical individuals providing decision-making support for patients with dementia in clinical practice.[5] We previously clarified the roles of nurses and actual conditions of nursing assistance related to support for decision-making regarding consent for surgery in elderly patients with dementia.[6] However, that study was qualitative in design, and although some hypotheses were formulated regarding decision-making support for elderly patients with dementia who are faced with the decision to consent to surgery, their validity as the factorial structure of nursing practices in a real setting was not tested quantitatively. Moreover, although some studies have been conducted on nursing practice abilities, nursing care provided for elderly patients with dementia, difficulties experienced by nurses in acute ward settings, and decision-making support for cancer patients in terminal care settings.[7–9] no studies have clarified the structure of nursing practices related to support for decision-making regarding consent for surgery in elderly patients with dementia.

This study aimed to clarify the factorial structure of nursing practices related to support for decision-making regarding consent for surgery in elderly patients with dementia.

SUBJECTS AND METHODS
Study design
This study was a cross-sectional descriptive study using a self-administered questionnaire to clarify the factorial structure of nursing practices related to decision-making support regarding consent for surgery in elderly patients with dementia.

Definition of terms
Nursing practices related to support for decision-making regarding consent for surgery in elderly patients with dementia
In this study, we defined these practices as support activities conducted for elderly patients with dementia who are faced with decision-making, i.e., the act of choosing one or several options from among multiple available options, to help them select the best option(s) by confirming their intentions, encouraging them to participate in the decision-making setting, and devising ways to promote their understanding by supplementing information as needed, while ensuring that the rights of patients are protected; for those whose decisions are difficult to confirm, efforts should be made to deduce their intentions from their behaviors and reactions to ordinary events.[6, 10]

Participants, survey period, and survey method
Participants
Participants were nurses with at least three years of experience working in orthopedic surgery wards at secondary emergency hospitals in the Kinki area who provided consent to participate in this study. These criteria were set for the following reasons: elderly patients with dementia are at high risk of falling, and falls can lead to fractures, for which the first treatment option is hospitalization/surgery, especially if the site of fracture is the femoral neck. Orthopedic ward nurses are thus the most likely to have extensive experience in attending IC sessions for elderly patients with dementia and engaging in nursing practices that support decision-making about consent to surgery. We set the requirement for experience of more than three years assuming that competent/proficient-level nurses (according to Benner's novice to expert model derived from the Dreyfus Model of Skill Acquisition),[11] who have acquired the ability to identify necessary nursing care based on patient characteristics, would have increased opportunities to sit in on IC sessions. For selection of survey participants, we recruited nursing managers at secondary emergency hospitals who agreed to participate.

The objective of this study was to clarify the factorial structure of nursing practices related to support

for decision-making regarding consent for surgery in elderly patients with dementia. To this end, the target sample size was set at ≥ 150 people, which is five times the number of observational variables (i.e., 30 items), given that the required sample size to generate appropriate statistical output for factorial analysis is 5–10 times the number of observational variables.[12]

Survey period and method

During the period from August to November 2018, 33 secondary emergency hospitals with an orthopedic surgery ward in the Kinki area were selected and a request form was mailed to the nursing manager at each facility to request their cooperation in the questionnaire survey. Nursing managers who agreed to cooperate were asked to select survey participants and distribute survey forms. Survey forms were collected by mail, using a return envelope enclosed with the survey form.

Survey contents
Participant attributes

The questionnaire consisted of the following seven items: age, sex, years of nursing experience, managerial position, highest level of education completed, experience (with or without) and frequency of attending IC sessions with physicians, and participation in in-hospital or out-of-hospital dementia training (with or without).

Nursing practice items related to decision-making support

We conducted interviews about i) the image of elderly patients with dementia, ii) experience in providing support for decision-making about consent to surgery, iii) memorable patients and families in the scenes of decision-making support, iv) difficulties in nursing care, v) details of decision-making support experience, vi) impressions from IC sessions attended in the past, and vii) challenges of decision-making support.[6] Verbatim recordings of the interview contents were created and analyzed, yielding the following six categories (16 subcategories): [devising ways to draw out the patient's intention according to the level of cognition], [responding to forms of support that may need to be reconsidered], [differences in awareness surrounding support as influenced by one's own experiences therein], [decision-making support with particular prioritization of family], [need for support that considers the family's fluctuating feelings after decision-making], and [need to provide future-oriented support based on underlying lifestyle factors]. Among these, we focused on nursing practices which support decision-making, creating 30 nursing practice items related to support for decision-making regarding consent to surgery in elderly patients with dementia from the following categories: [devising ways to draw out the patient's intention according to the level of cognition], [responding to forms of support that may need to be reconsidered], [need for support that considers the family's fluctuating feelings after decision-making], and [need to provide future-oriented support based on underlying lifestyle factors]. The validity of the 30 items was examined. We also conducted an interview and questionnaire survey, posing the following statement to participants: "We would like to ask you about nursing practices related to support for decision-making regarding consent for surgery in elderly patients with dementia."

Nursing practice items were rated on a 5-point Likert scale (1: Not applicable, 2: Not very applicable, 3: Neither, 4: Somewhat applicable, and 5: Very applicable). Participants with higher scores were evaluated as having higher nursing practice skills.

Analysis methods

Participant attributes were analyzed by simple tabulation.

First, for nursing practice items related to decision-making support, simple statistics were calculated for each variable, floor and ceiling effects were confirmed, and item-total (I-T) correlations were calculated.

Components of nursing practice were analyzed using exploratory factor analysis (promax rotation).

To verify internal consistency, Cronbach's α coefficients for each factor as well as all factors were calculated and examined. To examine structural validity, the Kaiser-Meyer-Olkin (KMO) test was used. Cronbach's α coefficients and item-remainder (I-R) correlations were calculated to examine reliability. In addition, content validity was examined.

Data were analyzed using SPSS for Windows, version 26. Statistical significance was assumed at $P < 0.05$ for all tests.

Ethical considerations

The present study was approved by the Tottori University Ethical Review Committee (approval No. 18A074). Since the present study was an anonymous self-administered questionnaire survey conducted to obtain new information, which included no personal information that required ethical considerations, obtaining IC was deemed unnecessary in accordance with the "Ethical Guidelines for Medical and Health Research involving Human Subjects." Nonetheless, an explanation was given to all participants using the questionnaire survey request form. Completed questionnaires were considered consent to participate in the study.

RESULTS

Characteristics of study participants

The questionnaire was distributed to 165 ward nurses, and 112 nurses responded. These responses (67.9% collection rate) were considered valid responses. Using the purposive sampling method[13] to limit the wards where nurses worked and number of years of experience, we created a final study participant pool of 112 nurses.

Participant attributes are summarized in Table 1. Most participants were female (108; 96.4%), four (3.6%) were male, with a mean age of 38.3 (± SD 9.8) years. Based on the contents of survey items, sex differences were unlikely to affect results (analyzed responses: $n = 112$). Sixty-seven (59.8%) participants had more than 10 years of nursing experience; 88 (78.6%) graduated from nursing schools, and 15 (13.4%) graduated from junior colleges and universities. With respect to managerial positions, 91 (81.3%) were staff nurses, and 20 (18.0%) were head nurses / chief nurses. Within the past six months, 73 (83.0%) nurses had participated in IC sessions with physicians via an assignment-based system, 31 (71.0%) as the person in charge on the day of the IC session, and 12 (70.6%) as a nursing manager (head nurses / chief nurses); among these, four (5.5%), one (3.2%), and two (16.7%) nurses, respectively, selected "on a regular basis" as a response to the question regarding frequency. A total of 72 (64.0%) nurses had participated in in-hospital dementia training, with 55 (76.4%) responding "within one year" and 17 (23.6%) responding "within two years"; 46 (41.0%) nurses had participated in out-of-hospital dementia training.

Structural reliability and validity of nursing practice factors

The floor effect was observed for Item 17. The ceiling effect was observed for Items 24 and 21, but only to a slight degree. Although the score distribution of the corresponding items revealed some skew, these items were included in the analysis, given that the purpose of the present study was to clarify the factorial structure and not the scale structure (Table 2). To verify the factorial structure, we calculated item-total (I-T) correlations for each item, which revealed I-T correlations in the range of 0.301–0.783. Excluding Item 7, which showed no correlation, an exploratory factor analysis of 29 items was performed. Defining the number of factors as the number of those with eigenvalues ≥ 1, we checked the screen plot and confirmed five factors, with initial eigenvalues being 9.148, 3.015, 1.574, 1.212, and 1.087 (Table 3). Next, exploratory factor analysis was performed to examine the number of factors needed to determine an appropriate factorial structure for nursing practice factors related to decision-making support. As changes in eigenvalues suggested that five factors were appropriate, exploratory factor analysis with promax rotation was performed.

The final factor pattern and results of inter-factor correlations after rotation are shown in Table 3. The initial eigenvalues for the sum of variances described in the output results were from 9.148 to 3.015, 1.574, 1.212, and 1.087, in order from the largest to smallest. The initial eigenvalue of the sixth-ranked candidate factor was 0.842, with a contribution rate of 70.33%. Therefore, there were five factors with an initial eigenvalue total of ≥ 1, accounting for 66.821% of the total variance of the 24 items. From these 24 items, a 5-factor structure was obtained. After the exploratory factor analysis and calculation of I-T correlations, the fifth factor was found to be two items. The results calculated by I-T correlations would be somewhat higher when the number of items is small.[14] Accordingly, the calculated results were confirmed by I-R correlations.

Factor 1 consisted of 10 items, six of which pertained to IC. Items related to advocacy for the rights of elderly patients with dementia through cooperation among medical professionals, especially physicians who play the central role in IC processes, had high loadings. Accordingly, this factor was referred to as [achieving advocacy for elderly patients with dementia through cooperation among medical professionals]. Factor 2 consisted of three items and was referred to as [advice considering the lifestyles and values of patients and their families]. Items with high loadings were related to talking to and thinking with patients about their concerns, and giving advice while considering their lifestyle prior to hospitalization. Factor 3 consisted of six items and was referred to as [support with a deeper understanding of elderly patients with dementia]. The item relating to the understanding of elderly patients with dementia had a high loading. Factor 4 consisted of three items and was referred to as [support that helps elderly patients with dementia to express their intentions]. The item relating to communication that promotes understanding when providing assistance had a high loading. Factor 5 consisted of two items and was referred to as [nurses' attendance in IC sessions for elderly patients with dementia]. Items that suggested efforts to and/or practice to attend IC sessions had high loadings. These five factors were positively correlated with each other. Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was above 0.500 at 0.858, indicating that the data were suitable for factor analysis (i.e., close to 1). Moreover, Bartlett's test of sphericity was statistically significant ($P < 0.001$)

Table 1. Participant attributes

n = 112

Category		*n*	%
Sex	Female	108	96.4
	Male	4	3.6
	Total	112	100.0
Age (years)	20s	26	23.2
	30s	30	26.8
	40s	38	33.9
	50s	14	12.5
	60s	3	2.7
	No response	1	0.9
	Total	112	100.0
	Mean	38.3	
	SD	9.8	
Years of nursing experience	3 years	7	6.3
	4–5 years	16	14.3
	6–8 years	15	13.4
	9–10 years	7	6.3
	≥ 10 years	67	59.8
	Total	112	100.0
Managerial position	Staff nurse	91	81.3
	Chief nurse	16	14.3
	Head nurse	4	3.6
	No response	1	0.9
	Total	112	100.0
Highest level of education completed	Nursing school	88	78.6
	Junior college	5	4.5
	University	10	8.9
	Graduate school	7	6.3
	No response	2	1.8
	Total	112	100.0
IC attendance experience (multiple answers possible)	Through an assignment-based system No	15	17.0
	Yes	73	83.0
	(Breakdown) On a regular basis	4	5.5
	Occasionally	45	61.6
	Rarely	24	32.9
	As a person in charge on that day No	12	27.9
	Yes	31	72.1
	(Breakdown) On a regular basis	1	3.2
	Occasionally	30	96.8
	As a ward manager No	5	29.4
	Yes	12	70.6
	(Breakdown) On a regular basis	2	16.7
	Occasionally	10	83.3
Dementia training	In-hospital No	40	36.0
	Yes	72	64.0
	(Breakdown) Within 1 year	55	76.4
	Within 2 years	17	23.6
	Total	112	100.0
	Out-of-hospital No	65	58.0
	Yes	46	41.0
	No response	1	1.0
	Total	112	100.0

Table 2. Results of 30 item analysis of nursing practices related to decision-making support regarding consent for surgery

	n	Mean (SD)	I-T correlation coefficient
1. I provide support for decision-making on a regular basis	112	2.90 (0.98)	0.685**
2. I try to guess and confirm the intentions of elderly patients with dementia while providing nursing assistance	112	3.66 (0.75)	0.574**
3. I try to draw out the feelings of elderly patients with dementia while providing nursing assistance	112	3.70 (0.68)	0.444**
4. When providing assistance, I communicate with patients using words and actions that allow me to understand them based on their expressions	112	3.93 (0.65)	0.301**
5. I do my best to be present at the time of IC for elderly patients with dementia in my care	112	3.40 (1.04)	0.627**
6. I make sure that I am present at the time of IC for elderly patients with dementia in my care	112	2.79 (1.06)	0.655**
7. I have the ward manager be present at the time of IC for elderly patients with dementia in my care	111	2.77 (1.07)	−0.022
8. I assess the level of cognition in the patient before attending the IC session	111	3.42 (1.03)	0.489**
9. I provide background information (disease, anesthesia, treatment, etc.) to the family before IC with physicians	112	2.71 (1.15)	0.597**
10. I confirm the thoughts of the patient/family before attending the IC session	112	3.20 (1.09)	0.781**
11. I confirm the thoughts of the patient during IC	112	3.07 (0.97)	0.783**
12. I ask the family about the intentions of the elderly patient with dementia to support their decision-making	111	3.29 (1.02)	0.725**
13. I ask the family and physician to allow the elderly patient with dementia to attend the IC session	111	2.73 (1.06)	0.783**
14. I tell the physician how the elderly patient with dementia ordinarily felt about surgery during IC	112	2.91 (1.10)	0.696**
15. Physicians communicate with elderly patients with dementia in an easily understandable manner	112	2.87 (1.05)	0.461**
16. I have advised physicians on the method of IC that promotes understanding of elderly patients with dementia	112	2.37 (1.13)	0.556**
17. I make suggestions, such as preparing materials or resources, in cooperation with physicians	112	1.79 (0.85)	0.442**
18. I record my observation/assessment of the patient/family regarding their levels of understanding and intentions during IC	112	3.37 (0.96)	0.657**
19. I propose holding a team conference when the patient's thoughts are unclear	112	3.10 (1.13)	0.635**
20. I supplement an assessment at the time of IC as I see fit	112	3.47 (0.91)	0.664**
21. I try to talk to the family when they seem troubled	112	4.03 (0.68)	0.609**
22. I listen to the thoughts of the patient/family when they have concerns and think through things with them	112	3.98 (0.75)	0.691**
23. I provide support considering the lifestyles of patients before hospitalization and their ADL	112	3.95 (0.67)	0.561**
24. Support changes depending on the relationship between the patient and family	111	4.04 (0.82)	0.386**
25. I support the patient/family by thinking about how they want to spend their lives in the future	112	3.88 (0.72)	0.640**
26. I gather information about the patient's relationships with their family (their lifestyles before hospitalization)	112	3.93 (0.74)	0.602**
27. I make efforts to learn about the characteristics of elderly people, dementia, and BPSD, etc.	112	3.76 (0.84)	0.498**
28. I work with people of other occupations to provide the best decision-making support	112	3.49 (0.96)	0.700**
29. I check whether there is a guardian in the case that elderly patients have dementia	112	3.48 (0.94)	0.471**
30. I actively participate in training for dementia nursing	112	3.13 (1.00)	0.500**

†Number of valid cases (per list). **$P < 0.01$.

Table 3. Results of exploratory factor analysis on the nursing practice items and Cronbach's α coefficients

Items	Nursing practice factors related to support for decision-making regarding consent for surgery					I-R correlation coefficient
	1	2	3	4	5	
Factor 1: Achieving advocacy for elderly patients with dementia through collaboration with medical professionals, 10 items (α = 0.906)						
17. I make suggestions, such as preparing materials and resources, in cooperation with physicians	**0.858**	−0.262	0.031	−0.034	−0.177	0.561**
14. I tell the physician how the elderly patient with dementia ordinarily felt about surgery during IC	**0.804**	0.024	0.080	0.006	−0.114	0.745**
16. I have advised physicians on the method of IC that promotes understanding of elderly patients with dementia	**0.794**	−0.008	0.011	−0.086	−0.138	0.619**
13. I ask the family and physician to allow the elderly patient with dementia to attend the IC session	**0.740**	−0.020	0.068	0.080	0.096	0.801**
10. I confirm the thoughts of the patient/family before attending the IC session	**0.632**	0.149	0.109	−0.004	0.050	0.749**
9. I provide background information (disease, anesthesia, treatment, etc.) to the family before IC with physicians	**0.606**	−0.035	0.007	−0.040	0.094	0.609**
19. I propose holding a team conference when the patient's thoughts are unclear	**0.566**	0.312	−0.082	−0.135	0.046	0.631**
15. Physicians communicate with elderly patients with dementia in an easily understandable manner	**0.551**	0.102	−0.242	0.033	0.049	0.492**
12. I ask the family about the intentions of the elderly patient with dementia to support their decision-making	**0.524**	0.099	0.209	0.075	0.015	0.644**
11. I confirm the thoughts of the patient during IC	**0.500**	0.058	0.028	0.094	0.321	0.742**
Factor 2: Advice considering the lifestyles and values of patients and their families, 3 items (α = 0.870)						
21. I try to talk to the family when they seem troubled	−0.019	**0.930**	−0.145	0.089	0.008	0.818**
22. I listen to the thoughts of the patient/family when they have concerns and think through things with them	0.191	**0.895**	−0.137	0.003	−0.017	0.806**
23. I provide support considering the lifestyles of patients before hospitalization and their ADL	−0.064	**0.682**	0.169	−0.112	0.044	0.642**
Factor 3: Support with a deeper understanding of elderly patients with dementia, 6 items (α = 0.823)						
28. I work with people of other occupations to provide the best decision-making support	0.060	−0.025	**0.775**	−0.237	0.243	0.659**
27. I make efforts to learn about the characteristics of elderly people, dementia, and BPSD, etc.	−0.144	0.124	**0.656**	0.210	−0.132	0.656**
26. I gather information about the patient's relationships with their family (their lifestyles before hospitalization)	−0.171	0.488	**0.574**	−0.010	−0.071	0.685**
25. I support the patient/family by thinking about how they want to spend their lives in the future	−0.027	0.359	**0.550**	0.026	−0.062	0.665**
30. I actively participate in training for dementia nursing	0.209	−0.233	**0.537**	0.098	0.006	0.456**
29. I check whether there is a guardian in cases involving an elderly patient with dementia	0.028	−0.086	**0.527**	0.085	0.037	0.498**

Table 3. *(Continued)*

Items	Nursing practice factors related to support for decision-making regarding consent for surgery					I-R correlation coefficient
	1	2	3	4	5	
Factor 4: Support that helps elderly patients with dementia to express their intentions, 3 items (α = 0.773)						
3. I try to elicit feelings from elderly patients with dementia while providing nursing assistance	−0.018	−0.039	0.031	**0.843**	0.029	0.669**
4. When providing assistance, I communicate with patients using words and actions that allow me to understand them based on their expressions	−0.108	−0.025	0.004	**0.667**	0.055	0.556**
2. I try to guess and confirm the intentions of elderly patients with dementia while providing nursing assistance	0.111	0.129	0.099	**0.586**	−0.031	0.610**
Factor 5: Nurses' attendance in IC sessions for elderly patients with dementia, 2 items (α = 0.852)						
5. I do my best to be present at the time of IC for elderly patients with dementia in my care	−0.126	0.072	0.069	−0.009	**0.875**	0.742**
6. I make sure that I am present at the time of IC for elderly patients with dementia in my care	0.101	−0.090	−0.019	0.075	**0.826**	0.742**
Initial eigenvalue	9.148	3.015	1.574	1.212	1.087	
Cumulative contribution (%: Factor 1 - Factor 5)	38.117	50.680	57.240	62.291	66.821	
Bartlett's test of sphericity			***			
Confidence coefficient α for the 24 items (*n* = 112)			α = 0.926			
Factor correlation Factor 1						
Factor 2 0.474**						
Factor 3 0.468** 0.608**						
Factor 4 0.313** 0.378** 0.493**						
Factor 5 0.594** 0.425** 0.451** 0.273**						

†Exploratory factor analysis; Promax rotation, *n* = 112, KMO value = 0.858. ***$P < 0.001$.

Internal consistency among the five subscales

Internal consistency among the five subscales was examined using the results of the factor analysis. Cronbach's α coefficients of internal consistency among subscales of [achieving advocacy for elderly patients with dementia through cooperation among medical professionals], [advice considering the lifestyles and values of patients and their families], [support with a deeper understanding of elderly patients with dementia], [support that helps elderly patients with dementia to express their intentions], and [nurses' attendance in IC sessions for elderly patients with dementia] were 0.906, 0.870, 0.823, 0.773, and 0.852, respectively. It was confirmed that, when items with total statistics of each subscale item were removed, Cronbach's α coefficients did not exceed the Cronbach's α coefficient calculated for all items (0.926), irrespective of which items were removed. As for correlations among the five factors, those between Factors 1 and 5 and between Factors 2 and 3 were moderate, while all other correlations among factors were weak.

DISCUSSION

For nursing practice factors, results of the factor analysis on the 24 nursing practice items related to decision-making support revealed a KMO value of 0.858 and a significant Bartlett's test of sphericity ($P < 0.001$), indicating the construct validity of and association among the 24 observed variables; thus, the analysis method was considered appropriate. In addition, five factors with eigenvalues ≥ 1 were extracted, with a cumulative contribution rate of 66.821%. The Cronbach's α coefficients for Factors 1 through 5 ranged from 0.773 to 0.906, indicating high internal consistency.

Since Cronbach's α coefficient for the 24 nursing practice items related to decision-making support was 0.926, the extracted factors were deemed appropriate as nursing practice factors related to decision-making support provided to elderly patients with dementia regarding giving consent to undergo surgery.

Interpretations of the five extracted nursing practice factors are provided below.

Factor 1: [Achieving advocacy for elderly patients

with dementia through cooperation among medical professionals]: The Declaration of Lisbon on the Rights of the Patient adopted by the World Medical Assembly in 1981 advocates for the right of patients to self-determination; the concept of IC was disseminated in conjunction with these advocacy efforts. In Japan, IC became widespread with the introduction of the long-term care insurance system, and in medical settings as well, the need for patient-centered decision-making, rather than paternalistic, physician-directed IC, has been increasingly prioritized.[15] Shinozaki et al. reported that some university hospitals have been working to develop a system which requires nurses to be present always when obtaining consent from patients to undergo surgery; in such a system, after the attending physician provides IC and signs the consent form, the assigned nurse confirms once again the patient levels of understanding and anxiety about surgery before signing the form themselves. In reality, however, there are issues on the side of medical professionals.[16] Takayama reported that explanations to patients may be omitted because medical professionals underestimate the ability of patients with dementia to understand what is being said, or that the lack of explanation capability is blamed on dementia.[2] Kawahara et al. reported that "there is not enough information sharing taking place between physicians and nurses."[17] Instead of thinking, "IC is impossible because the patient has dementia," providing decision-making support while keeping in mind that patients have the right to receive such support, with or without dementia, would lead to better advocacy for patient rights.

Shimizu proposed an information-sharing agreement model, which involves not only IC from physicians, but also explanations by the medical care team and the patient and their family; consensus formation is facilitated by having explanations from both sides.[15] The fee addition system for dementia care 1, which requires the involvement of a medical team in patient care, imposes a duty not only on nurses but also physicians, pharmacists, physical/occupational therapists, nutritionists, and social workers, etc. to participate in in-hospital dementia training. While assessment to improve team-based medicine will also be necessary, the effect of training to deepen mutual understanding among professionals through team-based organizational efforts can promote changes in awareness among physicians and strengthen team performance.

Factor 2: [Advice considering the lifestyles and values of patients and their families]: At the time of IC, the physician explains the condition of illness and treatment methods, and the patient provides information about their lifestyle and how they want to live. They consider together what is best at that moment and reach an agreement or a decision. While this process is important, there may be bias in the information offered up by the physician and patient. With regard to the content of IC by physicians, Kawahara et al. reported that "it is doubtful that [decisions] reflect the patient's feelings and thoughts."[16] Nurses, who work closely with patients to provide assistance during medical treatment, can compensate for such bias by attending IC sessions. If the family has any concern after IC, nurses can support them by talking to and thinking through the matter with them. Assessing ADL after surgery and advising the patient's family and physician on the ideal way of life after discharge will lead to improvement in patient quality of life.

Factor 3: [Support with a deeper understanding of elderly patients with dementia]: Yuasa et al. provided an analytical understanding of nursing skills required for patients with dementia undergoing treatment for physical disorders,[18] suggesting the importance of "understanding dementia as a disease." Understanding the characteristics of symptoms by type of dementia (i.e., Alzheimer's dementia, Lewy body dementia, frontal-temporal dementia, cerebrovascular dementia) allows nurses to choose appropriate nursing methods. Acquisition of knowledge will help lead to high-quality care.

As for training content that corresponds to the "fee addition for dementia care 2," training programs aimed to promote an understanding of dementia disorders, response to BPSD, communication methods, ethical issues unique to dementia, and decision-making support have been developed and implemented.[19] Training courses, such as those on case examination, help nurses realize the necessity of decision-making support that respects the intentions of elderly patients with dementia, as well as their roles in providing such support, in line with the code of ethics. Unfortunately, it can be difficult to offer training on person-centered care[20] or humanitude care,[21] or training for dementia specialist qualification, in settings other than out-of-hospital training due to limited human, material, and economic resources. With respect to participation in in-hospital and out-of-hospital dementia training, enhancement of team-based medical care is required due to the sophistication of medical care and multiplicity and diversification of patient issues. That said, given the limited manpower in multidisciplinary areas at secondary emergency hospitals, nurses' roles may be increased. The need to fulfill their roles may be a factor contributing to training participation.

Factor 4: [Support that helps elderly patients

with dementia to express their intentions]: Yuno et al. reported that, in the clinical judgment of orthopedic surgery ward nurses, elderly patients with dementia are perceived as special cases that require constant attention.[22] Their findings also suggested the need for nursing education to help nurses understand the pain and anxiety experienced by elderly patients with dementia who are hospitalized for femoral neck fractures, and learn specific assistance to obviate confusion and ensure their safety. Before providing support, the ability of patients to provide consent should be assessed objectively from the four aspects of "understanding, recognition, logical thinking, and expression of one's choice."[23] Support should be provided in a way that promotes patient understanding by preparing, presenting, and utilizing audiovisual materials as a means of communication according to patient ability. Support needed during IC is such that encourages patients to "explain," or to express their feelings. Interventions by nurses that involve deliberate communication are intended to gain a deeper understanding of values of elderly patients with dementia, and how they are coping with their disease. At the time of intervention, they should keep in mind that the sensory organs are deteriorating in elderly patients with dementia. Some patients might have lost their glasses or hearing aids, or are unable to use them due to damage or a dead battery. A ceruminous plug is a common cause of hearing loss in elderly patients with dementia. If elderly patients do not respond very well or appear to have difficulty understanding explanations, it is desirable to reevaluate their sensory organs for correctable conditions prior to IC.

Factor 5: [Nurses' attendance in IC sessions for elderly patients with dementia]: Scores of the Mini Mental State Examination and Hasegawa Dementia Scale-Reversion are not sufficient to judge whether elderly patients with dementia have the ability to understand the content of their diagnosis, or to choose treatment plans. Nurses need to assess the ability of elderly patients with dementia to understand/provide consent during nursing assistance and perform IC according to patient ability. Even if the patient's family says, "there is no need to explain because he/she cannot understand," an attempt should be made to explain if the patient is subjected to any medical intervention. In cases where the patient's intention cannot be presumed, a place for the patient, family, and surgeons to have full discussions should be set up, and necessary support should be considered using Jonsen's "four quadrants"[24] (medical indications, patient preferences, quality of life and contextual features) approach to clinical ethics. As necessary, ethics conferences and resource nurses may

be utilized. Acquiring knowledge about ethics consultation is an important role of nurses. If decisions on treatment policy are difficult to make, then surgeons can seek advice from their institution's ethics committee; however, this system is not yet fully functioning, given that only about 30% of hospitals have ethics committees in place.[25]

Next, the characteristics of the five extracted nursing practice factors is discussed below. Nishio et al. reported a 4-factor structure comprising [understanding of the content of explanation and psychological assistance], [protection of rights], [cooperation with physicians], and [creating a time and space for explanations] for decision-making support regarding treatment approaches in cancer patients.[9] Mashita et al. examined the scale of nursing practice abilities in acute wards and reported a 5-factor structure, which included [basic nursing care tailored to the situation of each patient], [nursing care for patients with high medical care dependence], [development of nursing processes tailored to the individual characteristics of patients], [performing roles as a member of a team], and [care to protect patient safety].[7] These factorial structures are similar to that identified in the present study regarding decision-making support for elderly patients, suggesting that knowledge and skills, as well as the roles played by nurses, are common factors in all nursing fields regardless of patient illnesses, health disorders, or age. In particular, [creating a time and space for explanations], [cooperation with physicians], [protection of rights] (reported by Nishio et al.) and [performing roles as a member of a team] (reported by Mashita et al.) reflect similarities with the elements of "achieving advocacy for elderly patients with dementia through cooperation among medical professionals" and "nurses' attendance in IC sessions," which form the core of the structure required for decision-making support for elderly patients. However, those previously reported factors are highly abstract, and in the case of support for elderly patients with dementia, some aspects require more specific consideration from nurses to accommodate features of dementia. Elderly patients with dementia often have lower cognitive function and insufficient judgment capacity. Thus, nurses need to provide support that promotes their understanding at every step of the IC process, while also ensuring that thoughts and intentions of patients are reflected in the decisions. In many cases, these differences arise because elderly patients with dementia are confused by their perception of reality (i.e., the hospital environment) due to the core symptoms of dementia such as "memory impairment" and "disorientation;" this further decreases or worsens their judgment capacity. We surmise that

this is precisely why nurses provide support that aims to prevent worsening of dementia symptoms, such as [advice considering the lifestyles and values of patients and their families], [support with a deeper understanding of elderly patients with dementia], and [support that helps elderly patients with dementia to express their intentions]. These nursing practices for dementia care are consistent with "respecting the personhood" of elderly patients with dementia, which is one of the four principal elements of the ICN Code of Ethics for Nurses.[26, 27] Our findings suggest the importance of nurse participation in the decision-making process, the generation of a deeper understanding of the patient by the whole medical team, and of striving to ensure that elderly patient understanding is sufficient by attending IC sessions and supplementing what they cannot comprehend, with the awareness that respecting patients' human rights is fundamental to the nursing practice.

Notably, [support with a deeper understanding of elderly patients with dementia] and [support that helps elderly patients with dementia to express their intentions] were unique to decision-making support for elderly patients with dementia. The fact that these factors were not identified in other fields of nursing suggests how truly difficult it is for elderly patients with dementia to comprehend this subject. It is thus all the more important for nurses to confirm the intentions of patients and devote their attention to get to know and understand patients. In particular, nurses should acquire a thorough understanding of symptoms according to the type of dementia; to this end, purposeful follow-up communication with the patient and their family can assist them in learning about the patient's subjective experiences and intentions.[28] The novelty and uniqueness of the present study lies in the identification of the factorial structure of nursing practices related to decision-making support that aligns with the characteristics of elderly patients with dementia, which clarifies the roles of nurses therein. As we are the first to report these, our findings will contribute to the development of the best decision-making support for elderly patients with dementia.

The best support for decision-making regarding consent for surgery in elderly patients with dementia can be achieved by promoting [support with a deeper understanding of elderly patients with dementia] on a regular basis and improving [support that helps elderly patients with dementia to express their intentions] in clinical practice, thereby allowing nurses to confirm patient intentions not only during IC but also before and after obtaining consent. If the patient's family has concerns, nurses should provide [advice considering the lifestyles and values of patients and their families], promoting [nurses' attendance in IC sessions for elderly patients with dementia]. These factors, together with [achieving advocacy for elderly patients with dementia through cooperation among medical professionals] (i.e., advocating for the rights of elderly patients with dementia through cooperation with other medical professionals, especially physicians who are central to IC processes), were extracted as five nursing practice factors that contribute to the achievement of the best decision-making support.

This study has several limitations. We asked nursing managers to select participants, specifying that they should have 3 or more years of experience working in orthopedic surgery wards at secondary emergency hospitals. This limited our sample size to only 112, and since the locations of the participating hospitals were in the Kinki area only, our results may not be generalizable to all areas. Further investigation will be necessary to expand the target area to the entire country and include acute surgery wards. Another limitation is of a statistical nature, in that the exploratory factor analysis may not be sufficient for suitability verification. Future studies should include additional tests such as criteria-related validity and retest methods in order to verify the reliability and validity of factors and to develop a scale that will allow for quantitative evaluation.

In conclusion, we conducted a questionnaire survey on nursing practices that support decision-making regarding consent for surgery in elderly patients with dementia, targeting nurses with more than three years of experience working in orthopedic surgery wards at secondary emergency hospitals in the Kinki area. The results of the factor analysis (exploratory factor analysis with promax rotation) using nursing practice items related to decision-making support revealed five components with eigenvalues ≥ 1 ([achieving advocacy for elderly patients with dementia through cooperation among medical professionals], [advice considering the lifestyles and values of patients and their families], [support with a deeper understanding of elderly patients with dementia], [support that helps elderly patients with dementia to express their intentions], and [nurses' attendance in IC sessions for elderly patients with dementia]), all of which were extracted as nursing practice factors related to support for decision-making regarding consent for surgery in elderly patients with dementia. The factorial structure of nursing practice related to support for decision-making regarding consent for surgery in elderly patients with dementia included five factors and 24 items. The reliability and construct validity of the factorial structure were also confirmed.

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