

Family Life Stability Scale for the Family Caring for Frail Elderly Persons

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ABSTRACT

Background : Family caregiving for a frail elderly person imposes a heavy burden on the entire family. Healthcare professionals supporting frail elderly persons at home should expand their practice to care for the family as a unit. This study aimed to develop the Family Life Stability Scale (FLSS) to determine the state and needs of family units caring for frail elderly persons at home.

Methods : On the basis of earlier grounded theory research, we developed the initial draft of the FLSS. It had its content validity examined by an expert panel and was pilot tested in 16 families. We then conducted a survey of 232 urban Japanese families caring for frail elderly persons at home. Exploratory and confirmatory factor analysis was used to verify the factor structure of the scale. Reliability was assessed with Cronbach's α coefficient.

Results : The final version of FLSS comprised 5 subscales (18 items). Confirmatory factor analysis affirmed the construct validity of the scale, with an acceptable fit between the factor structure and observed data. Cronbach's α coefficient for each factor ranged from 0.64 to 0.77, and the overall coefficient was 0.78.

Conclusions : The FLSS has acceptable validity and reliability. The FLSS shows clear areas for possible nursing intervention in family support and a structural perspective for assessing outcomes in nursing practice.

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Key words : nursing, family unit, elderly person, scale development, family life stability

INTRODUCTION

As aging populations continue to grow in industrial countries, health systems are undergoing change ; the care these systems provide becomes more extracted from the acute care setting¹, and the role that families play in caring for frail elderly persons in the community is becoming more important²⁻⁴.

However, such caregiving places a heavy burden on families. The issue of family caregiving has been researched

mainly through its effects on the primary caregiver, such as burden, satisfaction, and coping strategies⁵⁻⁹, and the health of the primary caregiver has been found to interact with the state of the family unit¹⁰⁻¹³. Family nursing recognizes that the health of a family member affects the health, wellbeing, and everyday life of the entire family because the family works as a system^{14,15}. To care for a frail elderly relative, family members must invest resources, such as time, energy, and money, diverted from their own lives, including their social life, family interactions, child rearing, and domestic

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chores^{6,16,17}. The cumulative effects of caregiving disrupt the life of the entire family¹⁷.

These effects suggest that healthcare professionals supporting frail elderly persons at home must expand their practice to care for the family as a unit. Such practice should be guided by sophisticated tools that assess the state and needs of the family.

Although many tools for assessing the family unit have been developed through multidisciplinary family research¹⁸⁻²⁷, few tools focus on families caring for elderly persons in the community. To assess such families, a tool should be practical and sensitive and accurately reflect the situation.

In the field of family caregiving, several research findings from qualitative induction suggest that the degrees to which competing needs within the family's daily life become routine and are reduced can be used to assess how stable the family's life remains as it cares for a frail elderly person^{7,12,28-30}. Therefore, nurses can likely support families to develop strategies that build daily routines and regulate competing needs.

A review of assessment instruments has suggested that those developed from a theoretical framework can help organize the nurse's thoughts, observations, and interpretation of information gathered and provide a rationale for nursing interventions²⁶. Therefore, the purpose of the present study was to develop an assessment instrument derived from a previous theory²⁸ to offer nurses a new scale to assess the stability of the lives of families caring for frail elderly persons at home.

METHODS

For this study, subjects defined as "frail elderly persons" were chosen by the directors of home-visit nursing stations included in this study on the basis of the following criteria: persons who require care of level 1 or greater who were enrolled in the public long-term care insurance system in Japan and have physical changes or chronic illnesses or both that occur with aging. Level of care (1 to 5 based on an assessment of care requirements) is used in the public long-term care insurance system in Japan, where level 5 indicates the highest level of need. In general, "elderly persons" are defined as those with an age 65 years or greater. However, if the director of the home-visit nursing

station determined that the person meets the above criteria, those 60 years or older were included in this study. "Family" indicates the unit that includes the frail elderly person and all other persons involved in the interactions related to at-home care for the elderly person and who have a blood or marital relationship with the elderly person.

To achieve the aims of this study, we performed the following 3 studies: study 1, item development and survey for evaluation of content validity by an expert panel; study 2, a pilot test to evaluate face validity and item analysis with 16 families; and study 3, a survey to verify the factor structure of the scale and the reliability of the newly developed instrument.

Ethical considerations

Before being performed this study obtained ethical approval from the Tokyo Health Care University Research Ethics Committee (No. 4). This study was performed in accordance with the Code of Ethics of the World Medical Association (Declaration of Helsinki) for experiments involving humans. Each participant received an explanation about study procedures in writing. Consent to participate was assumed by the return of the questionnaire.

Study 1

Item development

The theoretical framework of family life stability when caring for frail elderly persons was obtained from previous grounded theory research²⁸ (Fig. 1). This framework expounds that family life stability, namely the optimal status of the caregiving family, can be explained by the highest degree to which daily life becomes routine and the lowest degree of competing needs within the family. We assumed that each of the 2 core categories included 3 domains: state, conditions, and copings. For each domain, we extracted representative items from interview data obtained from 18 informants. In total, 76 items were generated (Table 1).

Evaluation of the content validity by an expert panel

Content validity (i.e., whether the item pool fully covered the necessary elements) was assessed by peer review with 2 collaborating researchers who have been working as researchers in the field of nursing for elderly persons or home-visit nursing. Also, content validity was evaluated through the assessment of interrater agreement³¹ by an ex-

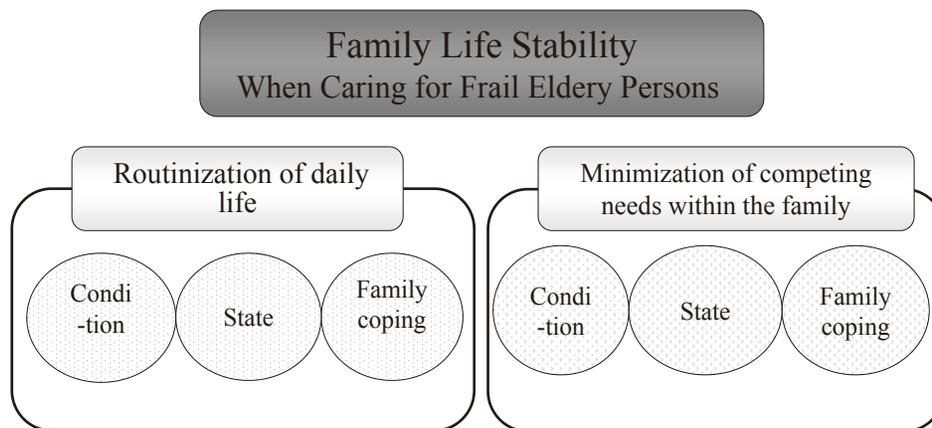


Fig. 1. Theoretical framework of family life stability when caring for frail elderly persons.

pert panel.

The expert panel was composed of 13 experts : 3 nursing researchers knowledgeable in scale development, 4 researchers specialized in geriatric nursing and home-visit nursing, and 6 practitioners of home-visit nursing. The panel was presented with documents regarding constructs and definitions of the subscales and with randomly sorted items. The panel was asked to categorize each item into the most appropriate subscale and set aside items that would not fit into any of the subscales.

We examined whether the questionnaire items would be placed under the subscales by checking the degree of matching between their responses. The results showed that agreement was low for condition and coping items about routinization and competition, with the panel's responses divided into either routinization or competition. However, we did not exclude those items at this time. Accordingly, the initial scale we developed, which we call the Family Life Stability Scale (FLSS), which is in the form of a self-reported questionnaire, consisted of 76 items that represented all 6 domains. The response format used a 4-point Likert-type scale to determine a member's perception of the family using the following scores : 0 = not applicable at all ; 1 = not very applicable ; 2 = quite applicable ; and 3 = very applicable. A higher total score was interpreted to mean that family life was more stabilized and in a better state while caring for a frail elderly person at home.

Study 2

The initial draft of the FLSS was pilot tested for evaluation of face validity and item analysis.

Eight home-visit nursing stations located in Tokyo were selected through convenience sampling. The director of each station was asked to choose 3 families caring for frail elderly persons according to above-mentioned inclusion criteria of this study and distribute the questionnaire to them. In total, of the 21 questionnaires distributed, 16 were returned by postal mail (response rate : 76.2%).

In the face sheet, we asked a family member who was thoroughly familiar with the family's situation as a whole to complete the questionnaire on behalf of the participant family. Also, to evaluate the face validity, we asked the family to point out any items that were difficult to answer and to comment on the clarity of each item's wording.

On the basis of their responses, we examined the items for which the families provided no response or pointed out issues in the wording and items that were highly similar based on high correlations between the items (Pearson's correlation coefficient of $r < -0.5$ and $r > 0.5$).

Sixteen items that some participants did not respond to matched items that were pointed out by other participants as being similar to other items. These items also had strong between-item correlations. Therefore, these 16 items were omitted from the investigation. Another 2 items that respondents indicated as ambiguous were also omitted. Items believed to have problematic wording were examined and modified.

Lastly, a revised FLSS consisting of 57 items (Table1), including 6 reversal items, was developed.

Study 3

Study 3 was conducted to initially test the psychomet-

Table 1. Family Life Stability Scale (FLSS) items (initial, 76 ; revised, 57 ; final, 18)

Category	Initial 76 items	Revisions	Revised 57 items	No of revised 57 items	Final 18 items
Routinization of daily life					
	The family has a set daily schedule.	Changes in wording	The family has a somewhat set daily schedule.	34	
	The family always carries out daily activities to a set time schedule.	Changes in wording	The family generally always carries out daily activities to a set time schedule.	16	
	The family has a set lifestyle routine.	Omission			
	The family has fixed ways of providing care.	Changes in wording	The family has fixed ways of providing care.	38	●
	The family is familiar with services for at-home care including visiting nurses, visiting careworkers, and routine bathing.	Changes in wording	The family knows people that provide at-home services, including visiting nurses and careworkers.	53	
	At-home services including visiting nurses, visiting careworkers, and routine bathing fits the pace of the routine of the family.	Changes in wording	The timing of at-home services, such as visiting nurse services, visiting caregiver services, and routine bathing, fits family lifestyle routines.	2	●
	(Name) is experiencing physical changes, including fever, vomiting, and diarrhea.	Reversed wording	The condition of (name) is stable.	20	●
	(Name) is psychologically stable.	Changes in wording	(Name) is sleeping well throughout the night.	32	
	(Name) has been able to do less tasks on his/her own lately.	Reversed wording	There has not been any changes in the level of necessary care at this time for (name).	43	
	The family has begun a new at-home service recently.	Omission	The family has begun a new at-home service recently.	54	
	There has been a change in the provider of at-home services lately.	Change in wording so that the meaning is not limited to medical care. Reversed wording	The family does not have any problems with care going poorly.	21	
	There are issues with (name) of the family and the use of medical equipment, including, feeding tubes, suction machines, tracheostomy tubes, and the urethral catheter.	Reversed wording	Other than (name), everyone else in the family is well at present.	8	
	One of the caregivers for our family is not well.	Changes in wording	The caregivers of the family are taking precautionary measures so as to not become sick.	44	
	The caregivers for the family are taking care of their health so as to not become sick.	Omission			
	The family knows why the condition of (name) has worsened.	Changes in wording	The family has acquired skills in care.	14	●
	The family knows why the use of medical equipment, including feeding tubes, suction machines, tracheostomy tubes, and the urethral catheter is not working well for (name).	Changes in wording	The family understands the symptoms of (name) very well.	22	
	The family members understand how the physical condition of (name) has worsened.	Changes in wording	The family is acquainted with what to do when care does not go according to plan.	33	
	The family knows what to do in the event that there are problems using the medical equipment for (name), including feeding tubes, suction machines, tracheostomy tubes, and the urethral catheter.	Omission			
	The family knows what measures to take when (name) becomes ill.	Omission			
	The family knows when not to worry when (name) becomes ill.	Changes in wording	The family is making a list of hospitals and visiting nurse stations that can provide emergency care.	5	
	There are hospitals and visiting nurse stations to assist the family during emergencies.	Changes in wording	The family is looking into finding someone to consult when care does not go well or when (name) becomes ill.	18	●
	The family has someone to consult when care does not go well or (name) becomes ill.	Changes in wording	The family can determine when it is a good time to call a doctor or visiting nurse.	45	
	The family can determine when it is a good time to call a doctor or visiting nurse.	Changes in wording	The family is managing well so that (name) does not become ill.	7	
	The family is managing well so that (name) does not become ill.	Changes in wording	The family is trying to calmly handle abnormalities in the physical condition of (name).	3	
	The family handles abnormalities in the physical condition of (name) without getting upset.	Omission			
	The family is able to handle problems with the medical equipment for (name) such as feeding tubes, suction machines, tracheostomy tubes, and the urethral catheter.	Changes in wording	Family requests are adequately communicated to at-home providers such as visiting nurses and care-givers.	24	●
	Family requests are adequately communicated to at-home providers such as visiting nurses and care-givers.	Changes in wording	The family looked hard for (or is looking for) at-home service providers of visiting nurses and care-givers that meet the family needs.	35	
	The family is very selective about the at-home service providers, including visiting nurses and care-givers.	Changes in wording	The family devises methods of care to meet family needs.	46	●
	The family modifies methods of care to meet family needs.	Changes in wording			
Minimization of competing needs within the family					
	There is someone in the family who feels constrained from providing care.	Omission			
	There is someone in the family who feels great distress over a lifestyle involving care.	Reversed wording	No one in the family feels great distress over a lifestyle involving care.	30	●
	Someone in the family feels that they cannot continue at-home care with the situation at present.	Reversed wording	The family wants to continue providing at-home care for (name) as long as possible.	17	
	The family feels that caring for (name) is not interfering with the lives of others.	Changes in wording	The family caring for (name) is not interfering with the lives of others.	26	●
	Family relationships are strained because of the care.	Changes in wording	Family relationships are sometimes strained over care.	39	●
	The family members argue with one another over care.	Changes in wording	The family members are all working together in providing care.	49	
	Someone in the family would like to use at-home services more.	Changes in wording	The family needs to use at-home services more.	13	
	Someone in the family believes that the role divisions for providing care need to be reevaluated.	Changes in wording	The family needs to reevaluate the role divisions for care.	23	

Table 1. Continued

Category	Initial 76 items	Revisions	Revised 57 items	No of revised 57 items	Final 18 items
Family coping	Family members are focused on caregiving.	Changes in wording	Family members lose themselves in putting effort into care.	27	●
	Family members always have to watch (name) out of worry.	Reversed wording	(Name) can be left by him/herself for a while.	40	●
	Someone in the family is not getting enough sleep because of caregiving.	Reversed wording	Family members get adequate sleep.	50	●
	Someone in the family has given up on what's important to them.	Reversed wording	Activities have been strictly limited because of the need to provide care.	55	
	Someone in the family is sick and in need of treatment besides (name).	Omission			
	The cost of providing care is putting pressure on family finances.	Omission	The cost of providing care is putting pressure on family finances.	28	
	Family members visit doctors when necessary.	Omission			
	Family members have time to focus on activities other than caregiving.	Changes in wording	Family member focus on activities other than caregiving sometimes.	11	
	Providing care does not interfere with family chores.	Changes in wording	Providing care does not interfere with family chores.	12	
	Everyone in the family cooperates in providing care in their own way.	Changes in wording	Everyone in the family cooperates in providing care in some way.	29	●
	Caregiving responsibilities are placed on a particular member of the family.	Reversed wording	Caregiving responsibilities are effectively divided among several people.	15	●
	Family members can relate to the feelings of (name).	Changes in wording	Family members can relate to the feelings of (name).	41	●
	(Name) has become more energetic since we started at-home care.	Changes in wording so that it is not limited to the energy level of (name)	Positive changes have been observed in (name) since beginning at-home care.	1	
	(Name) has become more motivated since the family began at-home care.	Omission	(Name) has become more motivated since the family began at-home care.	51	
	Family members feel that at-home care is going well.	Omission			
(Name) is appreciative of the family members.	Changes in wording	(Name) is appreciative of family members.	31	●	
The caregiver is appreciated by other members of the family.	Changes in wording	Other members of the family show appreciation to the caregiver at times.	42		
The family has no idea how long the caregiving will continue.	Changes in wording	The family feels anxious about how long caregiving will continue.	52		
The family just started at-home care for (name) recently.	Omission				
Someone in the family is getting sick because of caregiving.	Omission				
The family has not found an at-home care provider that they can rely on.	Omission				
Family members feel reluctant about letting others into the house.	Reversed wording	The family has no reluctance about the use of at-home care services.	57		
(Name) of the family does not like using at-home care services.	Omission				
Family members do not believe that care for (name) is going to continue much longer.	Omission				
The family believes that they are giving back by providing care to (name).	Changes in wording	The family believes that providing care to (name) is a great opportunity to give back.	47		
The family believes that their current circumstances are not as bad as that of other families.	Omission				
Family members believe that the present is not so bad, when considering what is to come.	Changes in wording	Family members believe that overcoming the present will be most important.	56		
When the family thinks about how difficult the past was, they believe that the present is not so bad.	Omission				
The family talk out their complaints regarding care to friends and acquaintances.	Changes in wording	The family relaxes by telling stories about care to family and acquaintances.	36		
The family has organized the environment to make providing care easier, such as by having beds lent out or hand rails installed.	Changes in wording	The family has organized the environment to make providing care easier, such as having borrowed beds available or hand rails installed.	6		
The family is flexible about working care around the schedule of the family.	Changes in wording	The family have developed unique ways for chores to be completed easier.	4		
Someone is in the family can fill in when the person designated to provide care is unable to complete his/her duties.	Changes in wording	The schedule for care is adjusted to meet the schedule needs of the family.	9		
The family plans to refresh by using at-home services.	Changes in wording	The family has someone to fill in when the person designated to provide care is unable to complete his/her duties.	25		
The family is unable to entrust care to the at-home care provider that they are using.	Changes in wording	When the caregiver wants to go out, someone in the family tries to fill in.	37	●	
The family is using the at-home service that they wanted to use.	Reversed wording	The family is using at-home services and taking time off to refresh.	48		
The family feels comfortable with entrusting care to the at-home service.	Omission	The family is comfortable with entrusting care to at-home providers.	19	●	
The family is able to obtain something priceless by providing at-home care.	Omission				
The family is able to obtain something priceless by providing at-home care.	Changes in wording	The family believes it is able to obtain something priceless by providing at-home care.	10		

ric properties of the FLSS for use with families caring for frail older persons at home.

Sample

The home-visit nursing stations selected for approach were all those registered with the National Association for Home-visit Nursing Care and located in the Tokyo metropolitan area or Kanagawa Prefecture, which are 2 adjacent urban areas in Japan. All 598 stations were requested by mail to participate in the study, and 86 of these stations gave consent (response rate : 14.4%). The director of each participant station was asked to choose 3 families according to the inclusion criteria of this study and to distribute the questionnaire to them. Through the 86 visiting nurse stations, questionnaires were distributed to 258 families, 232 of which responded (response rate : 90%).

Data collection

Data were collected during 2007. As in the pilot study, a member who was thoroughly familiar with the family's situation as a whole completed the questionnaire on behalf of the family. Families were also asked to separately fill out the FLSS considering the entire family's situation and answer additional questions regarding the following aspects : who completed the questionnaire, the elderly person's age, sex, primary disease, level of care need, medical care, duration of in-home care, family composition, main family caregiver's relationship with the elderly person, and age of the main family caregiver.

Analysis

Data were analyzed with the software programs IBM SPSS Statistics 20 for Windows and Amos 20 (IBM Japan Ltd., Tokyo, Japan).

Item analysis

The scoring deviation was based on the mean score of each item and examined. All ceiling effects ($[\text{mean} + \text{SD}] > 3$) and floor effects ($[\text{mean} - \text{SD}] < 0$) were < 0.50 ; therefore, no items were omitted. Items were also analyzed for a high (> 0.70) interitem correlation to assess redundancy, and no items were deleted.

Exploratory factor analysis (EFA) was performed to evaluate the construct validity of the FLSS, disclose underlying structures, and reduce the number of variables³¹.

Maximum likelihood method EFA with promax rotation was chosen as an extraction method. The Kaiser-Meyer-Olkin procedure was applied to measure sample adequacy. The criteria for selecting the number of factors were the inflexion point in the scree plot, the portion of variance explained by the last included factor, and the interpretability^{32,33}. As a result of the EFA, items were excluded when they had communalities < 0.20 , factor loadings < 0.45 , and factor loadings > 0.25 on multiple factors and contained fewer than 3 items³⁴. Finally, the extracted factors were interpreted on the basis of the meaning of the included items and were named.

Following EFA, the factor structure of the FLSS was evaluated with confirmatory factor analysis (CFA). The primary concern in assessing construct validity is the extent to which relationships among items included in the measure are consistent with the theory and concepts as operationally defined³⁵. We stated the hypothesized factorial structure based on the results of the EFA and the theoretical framework of this study and tested it by CFA. The model fitness was assessed with the following fit indices : chi-square test ($p > 0.05$), relative chi-square (CMIN/DF ; < 2), goodness-of-fit index (GFI ; > 0.90), adjusted GFI (AGFI ; > 0.90), comparative fit index (CFI ; > 0.90), root mean square error of approximation (RMSEA ; < 0.05)³⁶.

Reliability was assessed through internal consistency estimated with Cronbach's α .

RESULTS

Participant family characteristics

Of the respondents of the 232 participant families, 90.09% were the main caregiver. The elderly persons were most often female (58.18%) and had a mean age of 83.52 (SD : 8.56) years (Table 2).

Results of EFA

The Kaiser-Meyer-Olkin estimate for sample adequacy was significant at 0.80 ($P < 0.001$), indicating that the sample size was acceptable for factor analysis³⁷.

The initial EFA with no rotation for 57 items revealed the presence of 17 factors with eigenvalues > 1 , explaining 52.49% of the variance. Inspection of the scree plot showed steep slopes for the sixth and seventh factors. A 6-factor solution explained 41.81% of the variance with the last in-

Table 2. Family characteristics (N = 232)

Elderly person receiving care		
Sex	Female	135 (58.18)
	Male	96 (41.38)
Age of elderly person at the evaluation (years)		83.52±8.56
Level of care need ¹	≤ 2	41 (17.67)
	3	44 (18.97)
	4	40 (17.24)
	5	107 (46.12)
Primary disease	Cancer	18 (7.76)
	Intractable neurologic disease	23 (9.91)
	Cerebrovascular Disease	81 (34.91)
	Dementia	74 (31.90)
	Heart failure	35 (15.09)
	Senile decay	37 (15.95)
	Pulmonary emphysema/pneumonia	25 (10.78)
Medical care	Feeding through a gastrostomy tube	49 (21.12)
	Continuous instillation	6 (2.58)
	Aspiration	49 (21.12)
	Artificial respirator	7 (3.02)
	Wound care	65 (28.02)
	In-home oxygen therapy	20 (8.62)
	Urethral catheter management	38 (16.38)
Duration of in-home care	< 1 year	31 (13.36)
	≥ 1 and < 3 years	55 (23.70)
	≥ 3 and < 5 years	44 (18.97)
	≥ 5 and < 10 years	75 (32.33)
	≥ 10 years	27 (11.64)
Family composition	2-person household : patient and spouse	51 (21.98)
	2-person household : patient and a child	39 (16.81)
	3-person household : patient, spouse, and a child	29 (12.5)
	3-person household : patient and 2 children	20 (8.62)
	4-person household : patient, spouse, and 2 children	7 (3.02)
	> 5-person household, 3-generation family	31 (13.36)
	1-person household	14 (6.03)
	Other	36 (15.52)
No response	5 (2.59)	
Main family caregiver		
Age of main family caregiver at the evaluation (years)		63.42±10.81
Sex	Female	190 (81.89)
	Male	42 (18.10)
Relation to elderly person	Spouse	82 (35.34)
	Daughter	87 (37.50)
	Daughter-in-law	36 (15.52)
	Son	25 (10.78)
Use of external resources	Home-visit nursing	200 (86.21)
	In-home medical care	135 (58.19)
	In-home long-term care	133 (57.33)
	In-home bathing assistance services	134 (57.76)
	In-home rehabilitation services	80 (34.48)
	Day care/day services	59 (25.43)
	Short-stay medical care	57 (24.57)

¹Level of care need (1-5 based on assessment of care requirements) is used in the public long-term care insurance system in Japan, where level 5 indicates the highest level of need.

Values are numbers (%) or mean ± standard deviation percent unless otherwise indicated.

cluded factor explaining 3.50% of the variance. From this explanation, the number of factors was provisionally set at 6, and an EFA with promax rotation was repeated. The factor interpretability was examined from the correspondence relation between items and the factor. As a result, the interpretability of the first to fifth factor was well confirmed; however, the sixth factor was difficult to interpret, and all factor loadings of the items included in the sixth factor were lower than the cut-off point (0.26-0.44).

Therefore, we adopted a 5-factor model, and carried out the third EFA after eliminating 27 items due to low loading on 1 factor and 2 items due to high loadings on multiple factors. The 5-factor solution explained 49.61% of variance, with the last included factor explaining 5.32% of the variance. Then, to simplify the item structure, EFA was repeated 2 more times. Finally, a 5-factor solution with 18 items was extracted and it explained 59.43% of the vari-

ance, with the last included factor explaining 6.79% of the variance. The eigenvalues of the 5 factors were all greater than 1 (Table 3). Mean values for each of the 5 factors ranged from 4.67 (SD 2.69) to 7.36 (SD 2.79), and interfactor correlations ranged from 0.15 to 0.49 (Table 3). As for correlations among items with each factor, the fourth factor included items with low interitem correlation (0.19) (Table 4).

We interpreted and named the first factor as “Bonds among members of caregiving families,” which reflected the affectional relationships among family members, especially between the frail elderly person and other persons. The second factor, “Cooperation in a family providing care,” reflected the state of cooperation within the caregiving family. The third factor, “Full utilization of care services,” reflected attributes of the ability to achieve mastery of the home care service. The fourth factor, “Comfort in a care-based life-

Table 3. Obtained factor structure and loadings for the 18-items of the FLSS (N = 232)

Factor	1	2	3	4	5	Mean	SD	Category and domain of the theory	
1. Bonds among members of caregiving families									
Family members can relate to the feelings of (name).	.85	-.10	-.06	-.06	.04	7.36	2.79	MCNF	C
(Name) is appreciative of family members.	.68	.15	-.08	-.10	.00			MCNF	C
Family relationships are strained over care (reverse effect).	-.55	.06	-.04	-.07	.02			MCNF	S
No-one in the family feels great distress over a lifestyle involving care.	.48	.08	.11	.11	-.04			MCNF	S
2. Cooperation in a family providing care									
Everyone in the family cooperates in providing care in some way.	.09	.81	.07	.03	-.25	4.67	2.69	MCNF	C
Caregiving responsibilities are effectively divided among several people.	-.07	.70	.00	-.11	.23			MCNF	C
When the caregiver wants to go out, someone takes his/her place.	-.02	.69	-.08	.09	.11			MCNF	FC
3. Full utilization of care services									
Family requests are adequately communicated to at-home providers such as visiting nurses and caregivers.	.00	-.08	.69	.04	.01	10.26	1.84	RDL	FC
The family is comfortable with entrusting care to at-home providers.	-.05	.06	.65	.04	.00			MCNF	FC
The timing of at-home services, such as visiting nurse services, visiting caregiver services, and routine bathing, fits family lifestyle routines.	-.03	.02	.57	-.04	-.02			RDL	S
The family has someone to talk to when care does not go well or when (name) becomes ill.	.09	-.02	.50	-.08	.19			RDL	FC
4. Comfort in a care-based lifestyle									
(Name) can be left by him/herself.	.06	-.13	-.05	.61	.04	6.39	2.51	MCNF	C
Family members get adequate sleep.	.07	.03	.01	.58	.04			MCNF	C
Family members lose themselves in putting effort into care (reverse effect).	.14	-.08	.11	-.56	.03			MCNF	C
The condition of (name) is stable.	.01	.06	.19	.52	-.08			RDL	C
5. Proficiency in carrying out a care-based lifestyle									
The family has acquired skills in care.	-.04	-.01	-.01	.03	.82	6.12	1.85	RDL	FC
The family devises methods of care to meet family needs.	.10	.03	-.03	.20	.62			RDL	FC
The family has fixed ways of providing care.	.00	.02	.13	-.18	.50			RDL	S
Eigenvalues	4.12	1.88	1.77	1.70	1.22				
Interfactor correlations									
Factor 1		0.23	0.29	0.29	0.49				
Factor 2			0.23	0.15	0.33				
Factor 3				0.20	0.38				
Factor 4					0.26				
Factor 5									
Cronbach's α	0.72	0.77	0.68	0.64	0.68			total	0.78

Method of extracting factors : maximum likelihood method
 Rotation method : Promax method with Kaiser normalization
 RDL : routinization of daily life ; MCNF : minimization of competing needs within the family
 S : state ; C : condition ; FC : family coping

style,” reflected attributes of the family life situation, such as family members’ activities and rest, which were not restricted by caregiving and did not indicate an overcrowded condition. The fifth factor, “Proficiency in carrying out a care-based lifestyle,” reflected attributes of the ability to become accustomed to a life of caregiving.

Results of CFA

Following the identification of a 5-factor solution with EFA, CFA was performed to further test the structure of the FLSS. On the basis of the correspondence relationship between 2 core categories of the initial theoretical framework and the 5 factors extracted by EFA (Table 3), we hy-

pothesized multiple models and tested them with CFA. As a result, we adopted the second-order model as being the most suitable. That is, 1 of the second-order factors, “Degree of routinization of daily life,” accounted for the 2 first-order factors, “Proficiency in carrying out a care-based lifestyle” and “Full utilization of care services”; the other second-order factor, “Degree of minimization of competing needs within the family,” accounted for 2 of the first-order factors, “Bonds among members of caregiving families” and “Comfort in a care-based lifestyle”; and “Cooperation in a family providing care” was correlated with these 2 second-order factors. The values of the fit indices were approximately satisfactory (Fig. 2).

Table 4. Spearman’s rho values for item-to-item correlations of the 5 factors (N = 232)

Item	Q41	Q31	Q30	Q39
Factor 1. Bonds among members of caregiving families				
Q41 Family members can relate to the feelings of (name).	1.00			
Q31 (Name) is appreciative of family members.	0.56	1.00		
Q39 Family relationships are strained over care (reverse effect).	0.34	0.34	1.00	
Q30 No-one in the family feels great distress over a lifestyle involving care.	0.40	0.30	0.42	1.00
Item	Q29	Q15	Q37	
Factor 2. Cooperation in a family providing care				
Q29 Everyone in the family cooperates in providing care in some way.	1.00			
Q15 Caregiving responsibilities are effectively divided among several people.	0.53	1.00		
Q37 When the caregiver wants to go out, someone takes his/her place.	0.54	0.51	1.00	
Item	Q24	Q19	Q2	Q18
Factor 3. Full utilization of care services				
Q24 Family requests are adequately communicated to at-home providers such as visiting nurses and caregivers.	1.00			
Q19 The family is comfortable with entrusting care to at-home providers.	0.42	1.00		
Q2 The timing of at-home services, such as visiting nurse services, visiting caregiver services, and routine bathing, fits family lifestyle routines.	0.38	0.33	1.00	
Q18 The family has someone to talk to when care does not go well or when (name) becomes ill.	0.36	0.40	0.23	1.00
Item	Q40	Q50	Q27	Q20
Factor 4. Comfort in a care-based lifestyle				
Q40 (Name) can be left by him/herself.	1.00			
Q50 Family members get adequate sleep.	0.35	1.00		
Q27 Family members lose themselves in putting effort into care.	0.31	0.32	1.00	
Q20 The condition of (name) is stable.	0.32	0.39	0.19	1.00
Item	Q14	Q46	Q38	
Factor 5. Proficiency in carrying out a care-based lifestyle				
Q14 The family has acquired skills in care.	1.00			
Q46 The family devises methods of care to meet family needs.	0.57	1.00		
Q38 The family has fixed ways of providing care.	0.40	0.32	1.00	

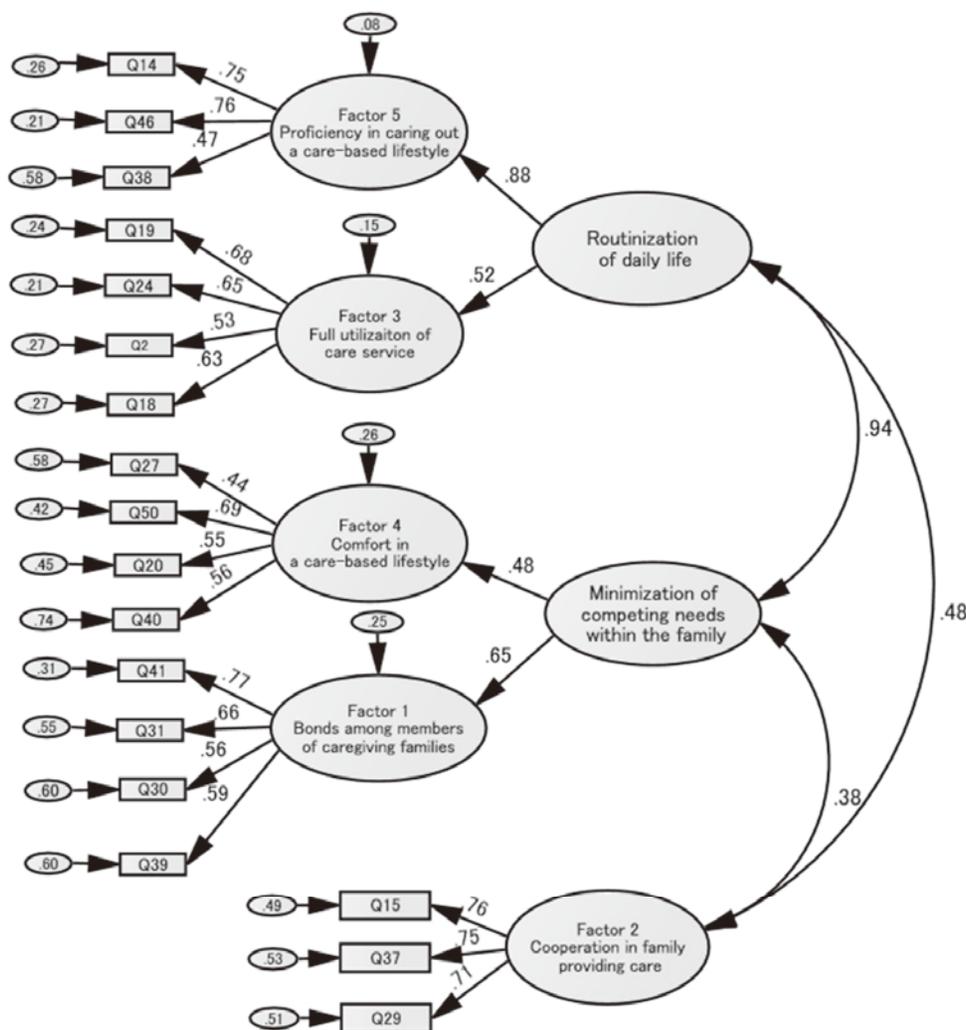


Fig. 2. Confirmatory factor analysis of the FLSS. All standardized coefficients were statistically significant ($p < 0.001$): χ^2 191.03 ($p > 0.01$); relative chi-square = 1.49; goodness-of-fit index = 0.91; adjusted goodness of fit index = 0.88; comparative fit index = 0.93; and root mean square error of approximation = 0.05 (P-Value for Test of Close Fit = 0.52).

Reliability

Cronbach’s α , as a measure of internal consistency reliability, was used for the total score and factor scores. The overall α for the total scale with 18 items was 0.78. Cronbach’s α for each factor ranged from 0.64 to 0.77 (Table 3).

DISCUSSION

We developed the FLSS as an indicator to determine the state and needs of families caring for frail elderly persons at home. Through the process of evaluating content validity by peer review and interfactor agreement by an expert panel, face validity in the pilot study, construct validity

by EFA and CFA, and reliability by internal consistency, the final version consisted of 5 subscales with 18 items.

The EFA is a useful analytic method that can determine how many constructs, or latent variables, or factors underline a set of items³⁴. As a result of EFA, a 5-factor solution was considered to be the most suitable, even though it failed to precisely replicate the theoretical framework consisting of the 6 domains. That the factor structure did not precisely replicate the grounded theory stage is not surprising³⁸ because factor structures often fail to replicate across samples. This failure of replication may explain the gap between the initially expected domains and factors actually extracted, given that our participating families had

longer caregiving durations than did families participating in earlier grounded theory research²⁸ that provided a basis of theoretical framework for the present study. Moreover, the most likely reason for this result is that state, condition, and family coping were included in routinization and competition altogether, which led to each being cancelled out by the other.

Relating these 5 factors to the initial theoretical framework of family life stability, we hypothesized the models and tested them with CFA to confirm the construct relationship among the latent variables and between those latent variables and the observed variables³⁹. The result of CFA, where the second-order model best fitted the data, indicates that the FLSS, consisting of 5 factors and comprising 18 items, has construct validity. Given this finding, we suggest that degrees of daily life routinization and minimizing competing needs within a family can be used to assess the stability of family life.

Regarding the reliability of the scale⁴⁰, Cronbach's α coefficients were < 0.7 for 3 subscales. Cronbach's α is influenced by the extent of covariation among the items and the number of items in the scale³⁴. The low Cronbach's α coefficients for these 3 subscales can be attributed to both reasons. However, the smaller number of items in each of these subscales is appropriate because they place fewer burdens on the respondents.

Several tools have been developed to assess the health of family units from various aspects, such as successful problem solving, communication, roles, affective responsiveness, affective involvement, and behavior control¹⁸, and levels of cohesion and adaptability²⁰⁻²². Compared with these tools, the FLSS, by focusing on the 2 domains of "Degree of routinization of daily life" and "Degree of minimization of competing needs within the family" and the 5 dimensions of "Bonds among members of caregiving families," "Cooperation in a family providing care," "Full utilization of care services," "Comfort in a care-based lifestyle," and "Proficiency in carrying out a care-based lifestyle," may closely assess and accurately reflect the lives of families caring for elderly persons at home. Accordingly, the FLSS will possibly be able to highlight areas for nursing intervention in support of the family caring for frail elderly family members and offer a new means for assessing outcome in nursing practice in this field.

The present study had several limitations. First, be-

cause the sample size was slightly small for factor analysis⁴¹⁻⁴⁴, further psychometric testing of the FLSS in a larger sample is needed. Second, the FLSS is a self-report instrument whose questionnaire is answered, with consideration of and full familiarity with the entire family's situation, by a representative family member. Therefore, if only 1 or 2 family members have completed the instrument, caution has been suggested in the family research context when the results are analyzed and generalized to the family as a unit^{26,31}. When the FLSS is used in nursing settings, adequate strategies should be considered, for example, combining its results with observational and interview data collected from multiple sources and with multiple methods.

CONCLUSION

We developed the FLSS as a practical assessment tool that can closely reflect the life situation of families caring for elderly persons at home in Japan. When the FLSS was first applied, construct validity and internal consistency were confirmed. The FLSS can help identify potential areas for nursing intervention and offer a means for assessing the outcome of a family's support.

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