ORIGINAL ARTICLE

Requirements for promoting the transition of aging patients with cognitive and physical disorders to home care: A new case analysis design

Katsutoshi Sasaki[1], Chihiro Torigoshi[1], Makiko Kondo*[2]

[1] *National Hospital Organization Hamada Medical Center, Japan*
[2] *Graduate School of Health Sciences, Okayama University, Japan*

Received: September 24, 2017 **Accepted:** April 7, 2018 **Online Published:** April 19, 2018
DOI: 10.5430/cns.v6n3p79 **URL:** https://doi.org/10.5430/cns.v6n3p79

ABSTRACT

Objective: This study clarified requirements for transitioning aging patients with cognitive and physical disorders to home care and developed a new mixed methodology using medical records.
Background: Japan has the highest proportion and highest rate of increase of older adults worldwide. Transitioning aging patients from hospital to home care is a key strategy to manage this increase; however, this transition presents challenges.
Methods: A mixed method study was conducted, using descriptive data from medical records.
Results: Of 41 participants, 61% were amicable settlement cases and 39% were non-amicable. In total, 56.1% went home: 36.6% were amicable and 19.5% were non-amicable. Requirements for transition to home care were [Patient's mental stability], [Necessary care for the patient within the family's tolerance level], [Decreasing the family's burden of care by accessing the public care service], [Preparing the family to bear the heavy burden of caring for multiple family members at home], [Decreasing the risk of worsening condition through patient compliance], and [Setting realistic goals and reconciling them with the family].
Conclusions: The transition requirements related to cognitive disorders, gaps in physical functioning before and after hospitalization, and aging society. They were fulfilled through concrete preparation of the family for coping with home care, with the patient's mental stability as a precondition.
Relevance to clinical practice: Fulfillment of these requirements is essential for successful transition to home care for aging persons with multiple disorders. Our original mixed method design promotes a new methodology for qualitative research using descriptive data from medical records.

Key Words: Cognitive disorder, Co-occurring disease, Aging, Transition to home care, Methodology development, Mixed methods, Case analysis

1. INTRODUCTION

Japan has both the highest proportion of older persons and the highest rate of increase of this proportion worldwide. New medical welfare systems are needed to cope with national financial difficulties brought on by rapid increase in the aging population. Although one strategy to reduce costs is transition from hospital care to home care, this is difficult for aging persons with both cognitive and physical disorders. Therefore, strategies are needed to prevent lowered quality of life of aging persons and increased burden on family

---

*Correspondence: Makiko Kondo; Email: mkondo@cc.okayama-u.ac.jp; Address: Graduate School of Health Sciences, Okayama University, 2-5-1 Shikata, Kita-ku, Okayama 700-8558, Japan.

caregivers.

1.1 Characteristics of aging

Characteristics of aging include decreased physical and mental capacity, chronic disease, a wide range of outcomes across different people, and facing difficulty to bouncing back as quickly from illness when they become ill.[1] While caring for aging persons, we must assume that multiple diseases, especially involving both cognitive and physical dysfunction, will bring more complex problems, compared to having single disorders, or only cognitive or physical dysfunction. We also expect that the aging population will face difficulties in living at home independently.

In dementia, the main symptom is cognitive dysfunction, and others are aphasia, agnosia, apraxia, executive function, and behavioral and psychological symptoms (verbal abuse, violence, wandering, missing, delusion, etc.). The prevalence of dementia in Japan among people aged 65 to 69 years is 1.5%, but this rate doubles every five years of age. The prevalence for those aged 85 years or older is 27%.[2] Therefore, aging is a risk factor for dementia. According to Ninomiya,[3] the prevalence of dementia is influenced by age, sex, and lifestyle (e.g., prevalence of diabetes). If we assume that the prevalence of diabetes will increase to 20% by 2060, the prevalence of dementia among people over 65 years will increase from 15% in 2012 to 34.3% in 2060.[3] The Japanese government has taken measures to avoid this situation for five years (2013–2017): developing a standard of care, ensuring early diagnosis and cure, making care service for sustainable living at home, supporting family, coping with early-onset dementia, and training of the medical and welfare staff.[4]

In relation to physical dysfunction, lifestyle-related diseases increase with aging. In descending order, these are the primary causes of death among people over 65 years in Japan: cancer, heart disease, pneumonia, cerebrovascular disease, and decrepitude.[5] However, sorted by descending importance of providing care, they are cerebrovascular disease, dementia, aging-related frailty, and falling and sustaining a fracture.[2] While cancer is the leading cause of death, cerebrovascular disease, dementia, and fracture increase the need for care by others.

The public care system for the aged in Japan is a long-term care insurance plan.[2] The financial resources available through this plan are taxes, national insurance paid by all adults aged 40 and older, and partial reimbursement through welfare insurance provided to aging patients. Public care services include visiting nurses, elderly day care, temporary care at nursing homes, nursing homes, renting welfare equipment, and renovation of houses. In 2013, the healthy life expectancy for men and women was 71.2 and 74.2 years, respectively, while the average life expectancy was 80.2 and 86.6 years, respectively.[5] The difference between health expectancy and life expectancy is about 10 years. The proportion of those who need care in the long-term care insurance program is 3.0% of 65–75 year-olds and 23% of those over 75 years.[5] Thus, extending the health expectancy of the elderly in Japan is a beneficial aim for the government. To extend health expectancy, it is important to prevent lifestyle-related diseases. Further, preventing cerebrovascular disease, dementia, and falling and sustaining a fracture would reduce the number of elderly who are bedridden.

1.2 Promoting home care through national policy

Over a quarter (26.7%) of Japan's population is over 65 years old, which is larger proportion in the world. In addition, the rate that this population is growing is faster than see in other countries around the world.[6] Therefore, arranging welfare and medical systems for this growing population in a short period of time represents a challenge, particularly as Japan faces the problem of a decreasing younger population and total population. In 2060, the total population decreased from 120 to 86 million persons, while the aging population rate increased to 39.3%.[5]

Following the Second World War, in 1951, a greater percentage of people died at home compared to dying in the hospital (82.5% to 9.1%, respectively). Conversely, in 2005, the percentages of deaths at home were far fewer than those in the hospital (12.4% and 78.4%, respectively).[2] The government has tackled the increased strain on the medical infrastructure in Japan by initiating the Integrated Community Care System, which enables the elderly with cognitive and physical dysfunction to live at home in their community with contiguous medical and welfare care.[2] The government is promoting the home as the space for recuperating and death for the elderly instead of the hospital. However, unlike the past where homes frequently included three-generation families, facilitating home care, the current family structure is small and more varied, which has weakened the family's ability to provide care and has led to the social problem of dying alone.

Transitioning patients with both cognitive and physical disorders is more difficult than those with one disorder. Research on persons with both cognitive and physical disorders is mostly about the relationship between dementia, impairment of mobility, and incontinence;[7] femoral neck fracture and dementia;[8–11] intervention for cognitive and physical disorders; eating training;[12] and backward-chaining technique.[13] There is little literature focused on transitioning patients with cognitive and physical disorders to home, although research on providing home care for persons with dementia exists.[14–16] Finally, because of the rate of increase of older persons and decrease of young persons in Japan, we must prepare the medical and welfare system to cope with related social changes. This study will help promote the Integrated Community Care System as a national policy and can help other aging countries.

1.3 Purpose of the study

The purpose of this study is to clarify the requirements to promote the transition of aging patients with cognitive and physical disorders to home care, and to discuss how to successfully support patients and their families. Additionally, we present original analysis procedures promoting a mixed methodology using medical records.

2. METHODS

2.1 Design

We developed a new case analysis methodology that retrospectively employed qualitative data from medical records.

There are different approaches to qualitative research, which are stylized and have specific methods of analysis. However, there is no unified method for case analysis. Each case contains rich and diverse information. While the analysis method must logically satisfy the purpose of the study, the richness and diversity of the information should not be compromised. Our new analysis method improves existing case analysis methods, allowing for consistency while maintaining the rich diversity of the case.

The strength of this study is our original mixed method. First, subjects were selected from the patients in a sub-acute care unit over a one year period. The purpose of the unit was progression toward the transition to home. Second, we identified categories of requirements that promote successful transition to home care using a case analysis of medical records. Last the demographic characteristics related to the requirements for the successful transition to home care were identified.

2.2 Setting

The study setting was the sub-acute care ward at H hospital in S prefecture. The role of the sub-acute care ward was to promote the patient's return to home, and it targets patients in nursing homes with acute exacerbations. The ward's goal was to provide effective care and ensure that the patient returns home within 60 days. Patients who had received acute care in orthopedics and cranial nerve surgery were accepted into the ward.

Further, S prefecture has the highest population aging rate; in 2015, it was 32.5%, whereas the average of all the prefectures is 26.6%, and has been consistently high since 1975.[17] S prefecture also has one of the most rapidly decreasing populations in Japan, and H hospital is the central hospital at S prefecture. Therefore, the results based on this field would suggest an accurate future estimate.

2.3 Subject selection

We identified all patients hospitalized at the sub-acute care unit for orthopedics and neurosurgery of H hospital in S prefecture from April 1, 2013 to March 31, 2014, and reviewed patient's demographic data and physical condition. We then selected research subjects who fit our inclusion and exclusion criteria.

In this study, cognitive disorder was defined as a diagnosis of dementia or appearing to have clear cognitive deficits. Physical disorder was defined as the condition of physical impairment contributing to declining daily living skills that remained after acute onset. In this study, subjects were limited to those with orthopedic and neurosurgical disease based on the requirements of the sub-acute care unit.

Inclusion criteria were as follows. First, patients had clear cognitive malfunction. Specific conditions were: (1) diagnoses of dementia or higher brain dysfunction following apoplectic stroke; (2) No dementia diagnosis, but prescribed donepezil hydrochloride or memantine hydrochloride, which are drugs for dementia; and (3) having behaviors indicative of dementia, including being unable to understand the nurse call button or use a sensor mat; being unable to understand the need for medical interventions of nurses, and needing to use protective gear on patients to prevent them from removing diapers or pulling out the drip tube. Second, patients were required to have been successfully treated through orthopedics or brain surgery, and having remaining physical dysfunction. Third, patients were required to being 65 years or older.

The exclusion criterion was not consenting to participate.

2.4 Data collection

We extracted a variety of information from subjects' medical records (see Figure 1). Demographic data included: (1) age, sex, family structure, key person, main caregiver in the family; (2) diagnosis and anamnesis; (3) location after discharge (own home, nursing home, or other hospital); (4) length of stay at the acute and sub-acute care unit; and (5) activities of daily life (transferring, cleaning, eating, eliminating) before hospitalization and after discharge.

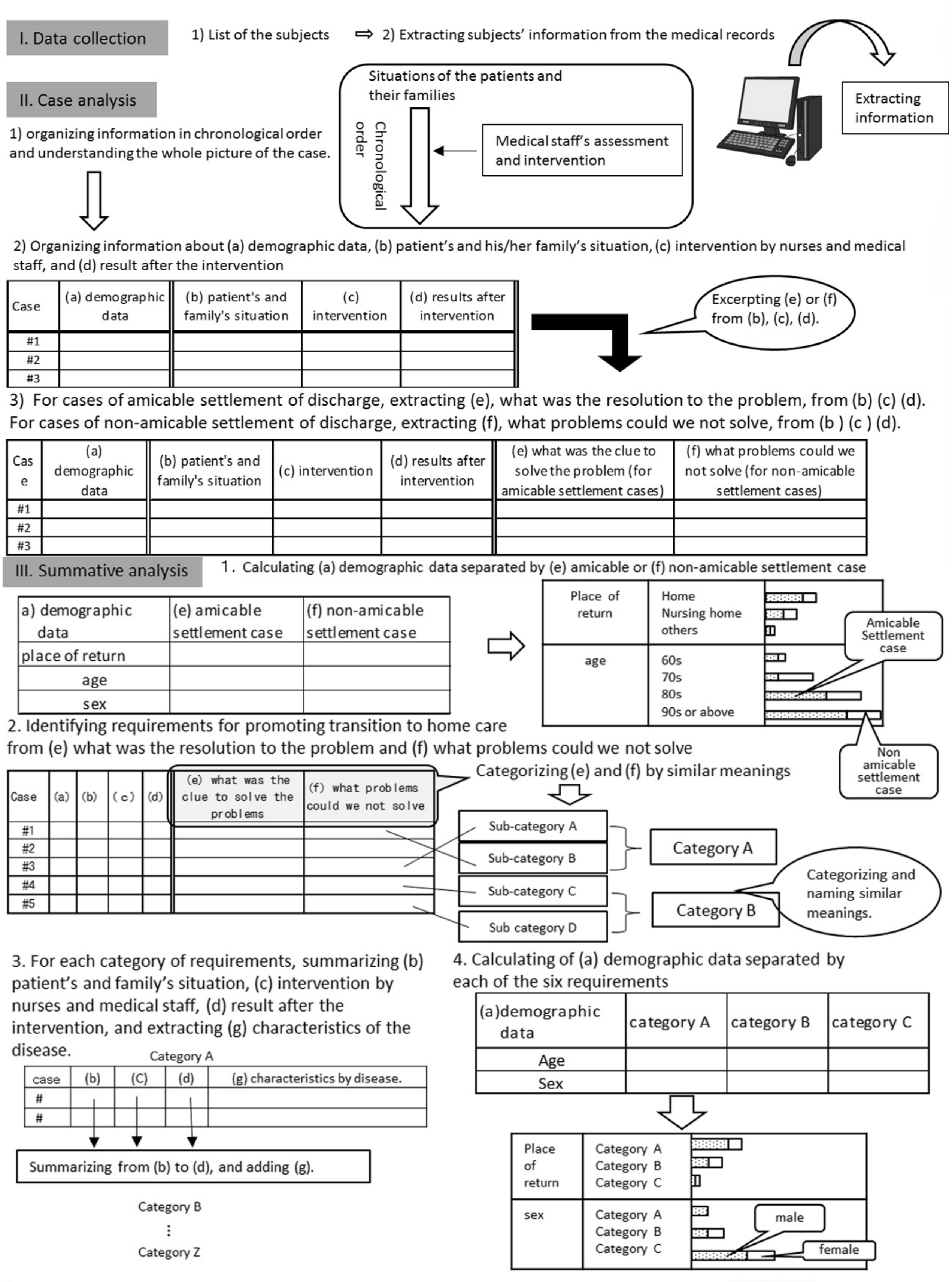

Figure 1. Flow chart of search results of studies from searching and screening

Usage of the Long-term Care Insurance System and intervention by different health care personnel was assessed as follows: (1) usage and application the of the Long-term Care Insurance System; (2) intervention by different health care personnel (medical social worker, physical therapist, occupational therapist, speech therapist, nutritionist, pharmacist); (3) adjustment to home care facilities by the Long-term Care Insurance System after discharge; (4) home renovation; and (5) receiving welfare equipment. Rehabilitation and professional guidance were assessed as follows: (1) implementation status of rehabilitation; (2) observation of rehabilitation by patient's family or care manager; and (3) nutrition guidance and pharmacy education. The patient's and family's intention about discharge were assessed as follows: (1) consciousness of the disease by the patient and family and (2) the patient's and family's thoughts and feelings regarding discharge. Finally, the nursing care plan and intervention for discharge were assessed as follows: (1) nursing care plans supporting discharge; (2) nursing intervention for discharge; (3) conference supporting discharge; and (4) expected problems after discharge.

2.5 Ethical considerations

The research ethics committee of the affiliated institution approved this research proposal. The "opt out method" was used to ensure informed consent according to the ethical guidelines for clinical studies by the Ministry of Health, Labour and Welfare and Ministry of Education, Culture, Sports, Science and Technology in Japan.[18] In accordance with this method, we publicized the purpose and method of the study, ethical considerations, and decision to participate or not at the bulletin board of the out-patient unit and website of the hospital for two months, where the general public, and patients and their families obtained information about the hospital. If the patient or family did not want to participate, we asked them to notify us and deleted their information.

2.6 Methods of analysis

A requirement was defined as "a criterion needed to achieve something". Please refer to Figure 1 for details of the methods used for analysis.

2.6.1 *Case analysis*

First, for each case separately, we categorized the above information and schematized the patient's and family's situation and medical staff's assessment and intervention in chronological order to understand the whole picture of the case.

Next, we summarized the baseline information: (a) demographic data (age, sex, disease, place for recuperating after discharge, family structure, degree of care necessary at discharge); (b) patient's and family's situation regarding the medical condition and daily life; (c) intervention by nurses and medical staff; and (d) result after the intervention. If more than one intervention was conducted for a case before discharge, we extracted (b), (c) and (d) separately.

Finally, based on (a), (b), (c) and (d), we decided whether each case involved an amicable settlement or non-amicable settlement. If the case involved an amicable settlement, we extracted further information: (e) what was the clue to solving the problem based on (a), (b), (c) and (d)? If the case involved a non-amicable settlement, we extracted further information: (f) what problems could not be solved? We classified cases as an "amicable settlement" when the patient and their family members were satisfied with the recuperating place after discharge and the medical staff did not feel anxious about the patient's or family's life after discharge. We classified cases as a "non-amicable settlement" for all other scenarios.

2.6.2 *Summative analysis*

First, we reviewed differences in demographic variables in amicable and non-amicable settlement cases. The classification was made based on (e) and (f), and (a) demographic data were calculated separately.

Second, we identified the requirements for promoting transition to home care. We read all case analyses with a focus on (e) and (f), assimilated similar meanings in (e) and (f), and created sub-categories and gave them names. Then, we created categories based on sub-categories. Although amicable case and non-amicable case appear to be opposites superficially, there are essential commonalities from the viewpoint of a successful transition to home care. Categories and subcategories were made according to the essential commonality that was named as "requirements".

Third, we summarized the interventions and their results for each requirement. In each category of the requirements, we read all the case information, and categorized and summarized: (b) patient's and family's situation, (c) intervention by nurses and medical staff, and (d) result after the intervention. In addition, we extracted (g) characteristics by disease.

Fourth, we reviewed differences in demographic variables in the six requirements.

In summary, we used a mixed method that is primarily a qualitative analysis and secondarily a quantitative analysis. All data were gathered from medical record by each patient. Qualitative analysis identified requirements for promoting transition to home care of aging patients, based on commonality into (e) what was the resolution to the problem in amicable settlement case and (f) what problems could we not solve in non-amicable case. Quantitative analysis was used to describe the demographic characteristics of amicable or non-amicable settlement case, and the requirements for successful transition of home care.

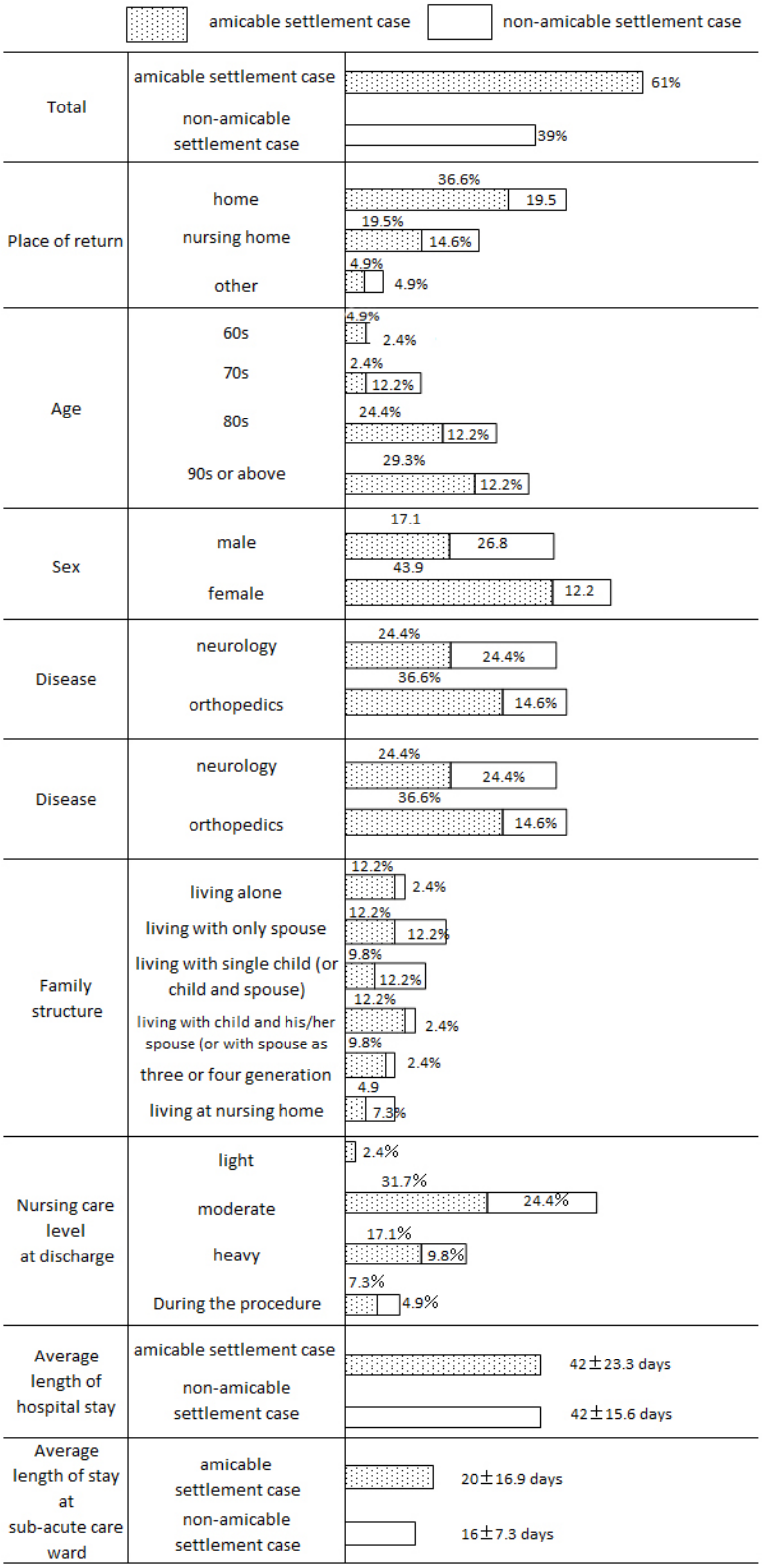

Figure 2. Demographic data by amicable settlement case and non-amicable settlement case (n = 41 patients)

Table 1. Extracting and naming of requirements

Category of requirements Sub-category of requirements	(e) What was the clue to solve the problem (amicable settlement case)	(f) Which are the problems we cannot solve (non-amicable settlement case)
1. Patient's mental stability		
1) Diminishing patient's excitement, violence, and wandering	Patient's excitement, wandering, and violence and injurious behavior toward self and others were controlled; rehabilitation could be started, and the wife can start taking care of him at home.	Patient's excitement, violence, and insomnia could not be controlled, and his wife is thought not to be able to care for him at home.
2) Alleviating depression	Patient's suicidal wishes and depression were controlled, and the patient and family started to think about the time after discharge.	—
2. Necessary care for the patient within the family's tolerance level		
3) Increasing patient's ADL and family's care skills	Patient started rehabilitation by growing his will, and his activities of daily living (ADL) changed from a bedridden life to life with a wheelchair. His elderly wife learned new skills that would be required after he came back home. After that, she started to come and take care of him at home.	Patient's ADL had become severely low after the stroke, and therefore the elderly wife with low energy could not care for him at home.
4) Intentionally finding time to learn and achieve care skills by family	By temporarily entering the nursing home after discharge, the family could prepare to care for him at home, for example, by learning the methods and skills of care and repairing the house.	After the stroke, the patient's ADL was severely low, and the family learned about care skills until discharge; however, they could not learn enough by discharge because they did not have enough time.
5) Intentionally decreasing the patient's ability to perform activities to decrease the family's burden of care related to wandering, so that they would be able to provide care in the home.	—	Patient suffered repeated fractures and dislocations from wandering and falling down. Because the patient's artificial head of thighbone was removed and his ADL became lower, his elderly wife could care for him at home.
3. Decreasing family's burden of care by entering the public care service		
6) Burden of main caregiver in the family buffered by using public care services	To prevent patient falls with the elderly wife, we created systems so that the wife alone would not be providing care, but rather they would be using public care to the maximum.	—
7) Collecting public home care service according to the schedule of the family when they cannot provide care and are short- handed.	Although at night time, the daughter and her husband came home, during the day, only the patient and his elderly wife were at home and the power of care was decreased. Therefore, they decided to use public care intensively during the day, and the family's anxiety was released.	—
8) Needing unlimited public services to cover the burden of care by family	—	Patient's physical dysfunction enhanced before hospitalization. However public care services had been used to the maximum before hospitalization, and they could not use additional public services. Therefore, the patient's elderly wife had to carry the burden.
9) Patient's personality leads to a refusal of public care	Public service was introduced to reduce the burden on the daughter-in-law. Patient was looking forward to visiting the day care center for seniors, and his daughter-in-law was expected to prevent cognitive functional decline by visiting the care center.	Because patient was a former principal and methodical, he could not allow a care helper into the house; therefore, his wife had to carry the burden of care. Their daughter could not bear to see her mother's suffering and burden of care, and feared that her mother was sick because of fatigue related to this burden. However, she lived far away, and therefore, could do nothing.
10) Family members who dislike the patient and do not wish to bear the burden of home care	—	Wife and daughter had faced domestic violence from patient, and refused to accept and care for the patient at home. Although the grandson was the key person, medical staff could not contact him.
11) Division of the role by other family members so the main care giver did not carry the burden alone	Other family members divided the role so the main caregiver did not carry the burden alone.	—
4. Preparing the family to bear the heavy burden of caring for multiple family members at home		
12) Making up the family's mind to bear the heavy burden of multiple types of care at home	Before the stroke, the patient's daughter worked at an office and cared for his wife with dementia, and the patient supported the daughter. After the stroke, the daughter must still work and care for the patient and his wife together, and her burdens have transgressed her tolerance. If the patient entered a nursing home, he must seek treatment for gastric fistula. However, his daughter is opposed to it because of incorrect information provided by the media. The medical staff provided the correct information, and daughter agreed to it and entered the patient into a nursing home.	Patient's wife had to care for her sister, and after the patient's fracture, his wife must care for both her sister and husband. Patient refused to live in a nursing home or to allow entry of public care service at home. His wife noticed her burden may exceed her tolerance, but she came home with the patient.

(Table continued on page 86)

Table 1. (continued.)

Category of requirements Sub-category of requirements	(e) amicable settlement case	(f) non-amicable settlement case
5. Decreasing the risk of worsening condition through patient compliance		
13) Developing skills to prevent accidental swallowing	Patient's daughter-in-law had the will to take care of him at home, because the relationship between the patient and daughter-in-law was good, but the risk of accidental swallowing was high due to the cognitive disorder. The family could make dinner that ensured prevention of accidental swallowing and he could come home.	Patient must seek treatment for gastric fistula, but he began vomiting after starting treatment. Therefore, his son decided not to come home.
14) Compliance toward taking medicine	Solitude. Due to cognitive dysfunction, the patient's house looked like a garbage dump. Because of wandering, malnutrition from refusal to eat, and refusal to take medicine, the disease was getting worse. To control the intake of medicine, the patient was entered into a nursing home.	—
15) Prevention of repeated falls	Patient refused care from family and public service because of not receiving help from others. However, the patient had suffered repeated falls and fractures because he could not understand the high risk. Through nurses' support, he unwillingly accepted minimum public service. Although the risk would not disappear, it would be reduced.	The patient suffered repeated falls and fractures. Although we used devices to prevent falling down, for example, by using a sensor mat, the risk of falling down and fracture did not decrease.
16) Prevention of dislocation	Because of cognitive dysfunction, patient did not remember having a fracture, and therefore, patient did not have a sense of the impending crisis of dislocation and was not compliant. After discharge, his wife ensured compliance to prevent dislocation.	—
17) Correction of family's misunderstanding about the disease	Patient lived with son's couple and grandchildren. Although the family could watch the behavior of the patient, the patient repeatedly suffered falls and fractures. Family could not understand the risk of falling down, and therefore a nurse lectured them about the patient's physical dysfunction and risk of falling down. The medical social worker entered minimum public service to prevent falls.	—
6. Setting realistic goals and reconciling them with the family		
18) Changing to realistic goals for physical dysfunction.	The original goal was walking with a caster walker, but when the family visited during rehabilitation, the family noticed the patient would not be able to use the caster walker in their narrow house. Therefore, the goal of rehabilitation was changed from walking with a caster walker to walking with a stick, and the term of rehabilitation was extended.	—
19) Changing to realistic goals based on the economic condition of the patient and family	Because of cognitive dysfunction, the patient was wandering, could not keep weight on after the fracture, and had a high risk of falling down. Therefore, the patient needed a guard day and night. He could not enter the nursing home because of high cost, and transfer to another hospital was difficult because the family could not meet the patient because of the long distance. They could choose a group home that housed five or six patients with dementia with helpers, and their needs for low cost and guarding day and night were met.	Because of economic reasons, entering into a nursing home was difficult, and therefore, rehabilitation was promoted in order to be able to come home. However, rehabilitation was not promoted because the patient had myocardial infarction, and the family did not want an invasive cure.
20) Reconcile each goal with the family members	Patient wanted to come home immediately, but the family wanted to do rehabilitation and diminish the risk of falling dawn. The family had the ability to provide care at home, because the patient was living with the son and his wife, grandson and his wife, and great-grandson. Therefore, the family's will was prioritized rather than the patient's will, and the patient was promoted to rehabilitation. After decreasing the risk, the patient came home.	The patient wanted to come home since this was the best case for rehabilitation, but his wife did not want the patient to come home and asked the doctor to persuade the patient to enter a nursing home. His three sons were passive toward the patient's coming home. Therefore, the patient had to go to a nursing home unwillingly.
21) Reconcile each goal between the patient and his/her family	Patient and his elderly wife hoped to come home early, but relatives who lived far away were anxious about their life after coming home. Because relatives looked at the rehabilitation and knew of the patient's functional recovery, they consented for the patient to come home early.	Patient's daughter and wife had a difference of opinion, because the daughter knew the reality of the patient's physical dysfunction, and she thought entering a nursing home was better. However, his wife had a high expectation of recovery and wanted him to come home. They did not arrive at the same decision, and therefore, the adjustment of entering public care service was late.

Note. Due to space limitations, only typical cases are shown

3. RESULTS

3.1 Demographic data

From April 1, 2013 to March 31, 2104, 277 patients were hospitalized in the sub-acute care unit, with 41 patients meeting our selection criteria. Twenty-two patients were aged 80 years or older (78.1%), and 17 were 90 years and older (41.5%). Type of disease was roughly distributed in half: 21 orthopedic patients (51.2%), 20 neurosurgery patients (48.8%). The place for recuperating after discharge was their home or a nursing home for 23 patients (56.1%) and 14 patients (34.1%), respectively.

3.2 Amicable versus non-amicable settlement cases

Of the 41 subjects, 25 had amicable settlements (61.0%) and 16 had non-amicable settlements (39.0%; see Figure 2). Of those going home (23 patients, 56.1%), 15 had amicable (36.6%) and 8 had non-amicable settlements (19.5%). Of those going to a nursing home (14 patients, 34.1%), 8 had amicable (19.5%) and 6 had non-amicable settlements (14.6%). There were more amicable than non-amicable settlements among those living alone, couples living with children, and in three or four generation homes. On the other hand, there were equal numbers, or more non-amicable than amicable settlements among those living with only a spouse, living with a single child, or living at a nursing home. In terms of average length of stay at the sub-acute care ward, amicable settlement cases were 20 ± 16.9 days, and non-amicable settlement cases were 16 ± 7.3 days.

3.3 Extracting and naming the requirements

Among the 41 subjects, 30 patients had received a single intervention and 11 patients had received multiple interventions from the medical staff. We analyzed 54 labels from (a) to (f). We focused on (e) and (f) and created 21 sub-categories and six categories (see Table 1).

3.3.1 *[Patient's mental stability]*

This category contained two sub-categories: 1) Diminishing the patient's excitement, violence, and wandering; and 2) Alleviating depression.

3.3.2 *[Necessary care for the patient within the family's tolerance level]*

This category contained three sub-categories: 3) Increasing the patient's activities of daily life and family's care skills, 4) Intentionally making time to learn and develop care skills by family, and 5) Intentionally decreasing the patient's ability to perform activities to decrease the family's burdens of care with respect to a wandering patient and enable care in the home by the family.

3.3.3 *[Decreasing the family's burden of care by accessing the public care service]*

This category contained six sub-categories: 6) Burdens of the main caregiver in the family buffered by using public care services, 7) Using public home care services according to the schedule of the family when they cannot provide care and are short-handed, 8) Needing unlimited public services to cover the burden of care by the family, 9) Patient's personality leads to a refusal of public care, 10) Family members who dislike the patient and do not wish to bear the burden of home care, and 11) Dividing the role between family members so that a single caregiver does not have to bear the burden of home care.

3.3.4 *[Preparing the family to bear the heavy burden of caring for multiple family members at home]*

This category contained no sub-categories.

3.3.5 *[Decreasing the risk of worsening condition through patient compliance]*

This category contained five sub-categories: 13) Developing skills to prevent accidental swallowing, 14) Compliance in taking medicine, 15) Prevention of repeated falling, 16) Prevention of dislocation, and 17) Correcting the family's misunderstandings about the disease.

3.3.6 *[Setting realistic goals and reconciling them with the family]*

This category contained three sub-categories: 18) Setting realistic goals for physical dysfunction, 19) Adopting realistic goals based on the economic condition of patient and family, 20) Reconciling each desired goal with the family members, and 21) Reconciling each desired goal between the patient and family.

3.4 Concrete nursing practices for meeting the six requirements

In Table 2, we summarize the interventions and results for each of the requirements.

3.5 Demographic data based on the six categories

Fifty-four interventions were identified from 41 subjects because some cases received more than one intervention. Twenty-nine patients had a single intervention for problem solving until discharge (70.7%), 11 patients had two interventions (26.8%), and one patient had three interventions (2.4%).

Six requirements were identified from these 54 interventions. [Patient's mental stability] contained five interventions, all interventions in the category were carried out with interventions in other categories to solve problems until discharge. [Necessary care for the patient within the family's tolerance level] contained nine interventions: four carried out independently, and five carried out in combination with interventions of other categories. [Decreasing the family’s burden of care by accessing the public care service] contained ten interventions: five carried out independently and five carried out in combination with interventions of other categories. [Preparing the family to bear the heavy burden of caring for multiple family members at home] contained three interventions: one carried out independently and two carried out in combination with others. [Decreasing the risk of worsening condition through patient compliance] contained 17 interventions: 13 were independent interventions and four were combined with those from other categories. [Setting realistic goals and reconciling them with the family] contained 10 interventions: 6 independent and 4 combined with interventions of other categories.

Table 2. Concrete nursing practices for meeting the six requirements

Requirement			
(b) Patient and his/her family situation	(c) Intervention by nursing and medical staff	(d) Results after intervention	(g) Characteristics by disease
[1. Patient's mental stability]			
[Situation of patient] a. Sudden onset, change of environment by hospitalization, anxiety over separation from family b. Higher brain dysfunction (personality changes, uncontrolled emotions) due to stroke	a. Decreasing patient's anxiety by being with family b. Controlling with medicines c. Consultation with attending physician or psychiatrist d. Adjusting medication e. Reducing risks of falls. For example, using sensor mats f. Improving day–night reversal.	[Good result] a. Patient comes to listen to others' advice by healing patient's existing condition. b. Family started to think they may be able to care at home. [Bad result] a. Patient cannot start rehabilitation because of not healing existing condition. b. Family refuses to provide care at home because of patient's existing condition.	Existing condition, violence appeared in neurosurgical disease characteristics.
[2. Necessary care for patient within family's tolerance level]			
[Patient] a. Through worsening of the patient's physical function, patient cannot continue to perform activities of daily life by himself/herself. b. Patient's will for rehabilitation and recovery is decreasing because of dementia or higher brain dysfunction. [Family] a. Main caregiver in the family must provide all care, because family is small. Aging family care for aging patient. b. If patient lives with children and offspring, the couple goes to work and does not stay at home during the day time. c. Because the main caregiver at home has a chronic disease, dysfunction, and/or is aging and has a physical dysfunction, the power of care by the main caregiver is weak. d. Caregiver at home does not have knowledge of care. [Living environment] Patient's house has limitations in terms of living with dysfunction, because the house is narrow, not barrier free; for example, not able to use a wheelchair or walker.	a. Through rehabilitation, patient's physical function improves. b. Decreasing the burdens of the caregiver involves prioritizing rather than promoting the patient's physical functioning; for example, to reduce the caregiver's burden, patient should be fed on the bed and not on the wheelchair. c. Caregiver in the family learns skills for care giving. d. Creating time for preparing for home care by the family by visiting other hospitals or nursing homes temporarily before coming home. e. Renovation of the house in order to live with the physical disorder.	[Good result] a. Main caregiver in the family has self-confidence and sees the end in sight. b. Patient can independently promote daily activities of life. [Bad result] a. Main caregiver in the family is exhausted, and patient and family are together ruined. b. Medical and ethical problems may occur.	There is no difference between neurosurgical and orthopedic diseases, but there are significant changes in the patient's physical functioning before and after hospitalization.
[3. Decreasing family's burden of care by entering the public care service]			
a. Suddenly, the patient's physical function has decreased compared before hospitalization. b. The person able to give care has limitations and the main caregiver must bear the burden of care, because other family members go to work during the day, or the patients is living with only an old couple, or there is a bad relationship between relatives. c. Power of care by main caregiver is weak, because he/she is aging or has diseases. d. Patient cannot enter nursing home, for reasons of economic difficulty e. If patient lives in a bad location, he/she cannot receive the public care service.	a. Try to increase ability to use the public care services through re-assessment of patient's physical function and changing degree of care requirement into the public care service system. b. Try to use various public care services; visiting nursing, day care center for service, short staying at nursing home, visiting home helper c. Using welfare and nursing supplies to decrease the burden of the caregiver and sustain the patient's life at home (electric bed, pressure dispersion mat, etc.) which can be rented from the public care service system, and fixing up the house through a subsidy from the public care service system. d. Obtaining public care service during the time when family cannot provide care because of working, etc. e. If patient cannot use the public care service because of the location of the house (car cannot enter narrow road), changing the place of residence after discharge, to one where the patient can use the public care service (e.g., going back not to the patient's house but to the daughter's house in the city). f. If the patient cannot enter the nursing home because of economic difficulty, search for low cost medical or welfare institutions.	[Good result] a. Heavy burdens of care of the main caregiver in the family is relieved and the patient can live at home. b. Time spent by the patient alone during the day is decreased, and risk of falling down and fracture is decreased. c. Through care by medical and welfare staff, the patient's physical function is maintained or increased. d. The desire to live at home by the patient and family is met. [Bad result] a. Because of economic difficulties, the family cannot enter the nursing home and decide to come home; therefore, the main caregiver has a heavy burden and risks mutual destruction. b. Because of a bad location of the house (e.g., public care service car cannot reach the house because of a narrow road), patient cannot receive public care service; therefore, the patient must enter the nursing home or come home without public care service.	There are no characteristics of type of disease, but this is influenced by social condition, for example economic condition, and housing location.

(Table continued on page 89)

Table 2. (continued.)

Requirement			
(b) Patient and his/her family situation	(c) Intervention by nursing and medical staff	(d) Results after intervention	(g) Characteristics by disease
[4. Preparing the family mentally to bear the heavy burden of multiple types of care home]			
a. There are other elderly who already require care at home, besides the patient. b. Physical conditions of the patient have worsened between before and after hospitalization. c. There are no persons to care for the patient in the family except the main caregiver. d. The patient refuses to enter the nursing home.	a. There are other elderly who already require care at home, besides the patient. b. Physical conditions of the patient have worsened between before and after hospitalization. c. There are no persons to care for the patient in the family except the main caregiver. d. The patient refuses to enter the nursing home.	a. There are other elderly who already require care at home, besides the patient. b. Physical conditions of the patient have worsened between before and after hospitalization. c. There are no persons to care for the patient in the family except the main caregiver. d. The patient refuses to enter the nursing home.	a. There are other elderly who already require care at home, besides the patient. b. Physical conditions of the patient have worsened between before and after hospitalization. c. There are no persons to care for the patient in the family except the main caregiver. d. The patient refuses to enter the nursing home.
[5. Reducing the risk of becoming worse condition by maintaining compliance instead of patient]			
a. Due to cognitive disorder, patient cannot maintain compliance by him/herself. b. Patient has chronic diseases, which require constant treatment. c. With the need for hospitalization due to the new disease, other physical disorders begin to occur.	a. Instructing the family about how to maintain compliance. b. Thinking about how to maintain compliance in the home, which has limitations. c. Entering public care service in home care. d. If the family cannot provide care at home, consider abandoning home care and entering a nursing home, where medical or welfare staff can maintain compliance.	[Good result] a. Others, instead of the patient, maintain compliance after discharge, which can reduce the risk of worsening of the disease. [Bad result] a. Others cannot acquire skills and knowledge about maintaining compliance after discharge, therefore, the risk of worsening of the disease is higher after discharge.	a. In the case of new neurosurgical disease, coping with the swallowing dysfunction is important. b. In the case of new orthopedic disease, coping with contraindicated limb position is important. c. Coping with chronic disease is important, because it is difficult to prevent worsening of total physical functioning and repeated occurrence of stroke.
[6. Changing to realistic goals and reconciling goals with the family]			
a. The gap between the patient's physical functioning before and after hospitalization is significant, especially in cases in which the patient could self-sustain activities of daily life. b. Family could not understand the pathological mechanism, and has excessive expectations. Understanding the possibility of recovery is difficult for the family. c. There are those who do not know and those who know among the family members about the reality of the patient's physical dysfunction. d. Family member's opinions are divided due to economic reasons (paying for the nursing home is expensive, and the patient cannot enter the free nursing home immediately), and poor living environment for home care.	a. Family have the opportunity to learn about the reality of the patient's physical functions; how much the patient will recover and how long it will take to recover. For example, family visit to see rehabilitation, and patient comes home for one day and night as testing. b. Discussion in the family c. Refurbish the house for physical dysfunction, and adjustment to enter the public care service. d. When selecting living place after discharge, do not prioritize coming home and consider places without prejudice, which correspond with the patient's physical disorder, family's desire, especially using rehabilitation hospitals effectively between sub-acute hospitals and home care. e. If the patient is dying, prepare home care not for cognitive and physical disorders but for dying. For example, clarifying the purpose of home care, and securing a visiting doctor and nurse who are good at end of life care at home.	[Good result] a. Both patient and each family members are satisfied with the choice of living place after discharge. b. Family can come to accept the reality of the patient's physical disorder, care ability of family, and living environment. c. Patient and family have confidence with living at home. [Bad result] a. Either patient or each family member is discontented about the living place after discharge.	a. Gaps in patient's physical functioning and degree of self-sustaining of daily life activities are significant between before and after hospitalization. b. In orthopedic diseases, the risk of falls and sustaining fractures is a problem. In neurosurgical diseases, the difficulty is in understanding how much the patient can recover.

Figure 3 shows amicable or non-amicable settlement cases, place of return, and other demographic data separately by the six requirements.

4. DISCUSSION

This study identified six requirements for promoting successful transition of aging patients with cognitive and physical disorders to home care from their clinical medical records. Additionally, we showed demographic data regarding amicable and non-amicable settlement cases and based on the six requirements.

4.1 The six requirements

The six requirements identified were: [Patient’s mental stability], [Necessary care for the patient within the family’s tolerance level], [Decreasing the family’s burden of care by accessing the public care service], [Preparing the family to bear the heavy burden of caring for multiple family members at home], [Decreasing the risk of worsening condition through patient compliance], and [Setting realistic goals and reconciling them with the family].

[Patient’s mental stability] shows that risky behaviors and personality changes (e.g., violent behaviors and abusive language) are induced by neurological diseases in many cases, which prevented rehabilitation. [Decreasing the risk of worsening condition through patient compliance] showed that the patient must prevent accidental swallowing, repeated falling, and dislocation, and must show medication compliance; however, cognitive deficits interfere with compliance, necessitating help from others. These two requirements are related to cognitive disorders.

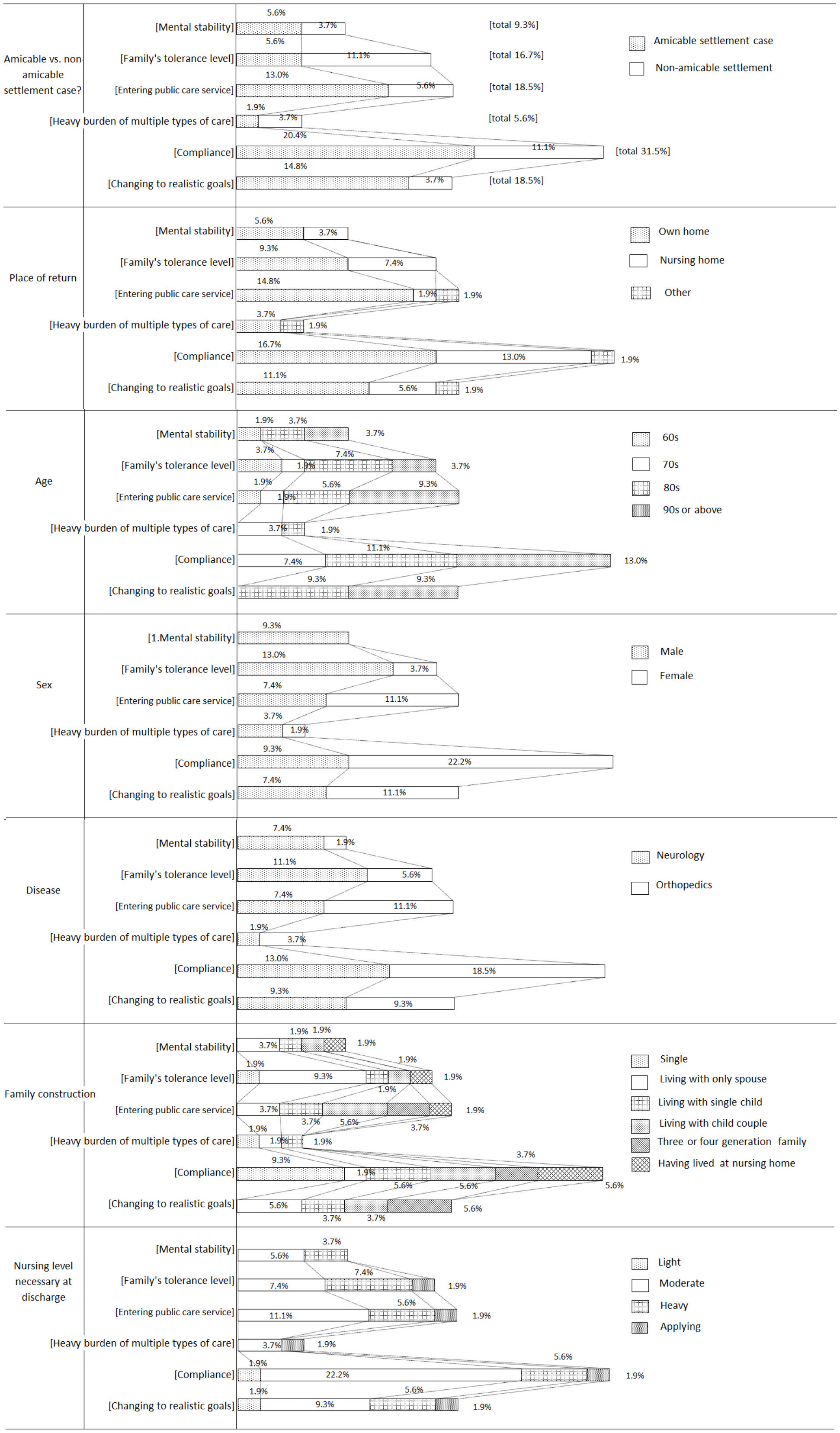

Figure 3. Demographic data by the six requirements (n = 54 interventions)

Note: [Mental stability] is Category 1, [Family's tolerance level] is Category 2, [Entering public care service] is Category 3, [Heavy burden of multiple types of care] is Category 4, [Compliance] is Category 5, and [Changing to realistic goals] is Category 6

[Necessary care for the patient within the family's tolerance level], [Decreasing the family's burden of care by accessing the public care service], and [Setting realistic goals and reconciling them with the family] show how to keep patient's alive and reduce the care burden on the family. There are often large differences in patients' independence related to activities of daily life before and after hospitalization, because of acute onset and subsequent sequelae. These requirements are not differences between neurological and orthopedic diseases, but r are related to differences in patient functioning before and after hospitalization.

[Preparing the family to bear the heavy burden of caring for multiple family members at home] shows the familial struggles with providing sufficient care. The family's burdens are increasing because of the increased elderly population and the dissolution of the traditional three-generation family[5] This requirement is caused by an aging society, and shows the reality of older patients' care by older family.

Therefore, the six requirements for promoting transition to home care are related to cognitive disorders, the gap before and after hospitalization after acute onset, and an aged society (see Figure 4).

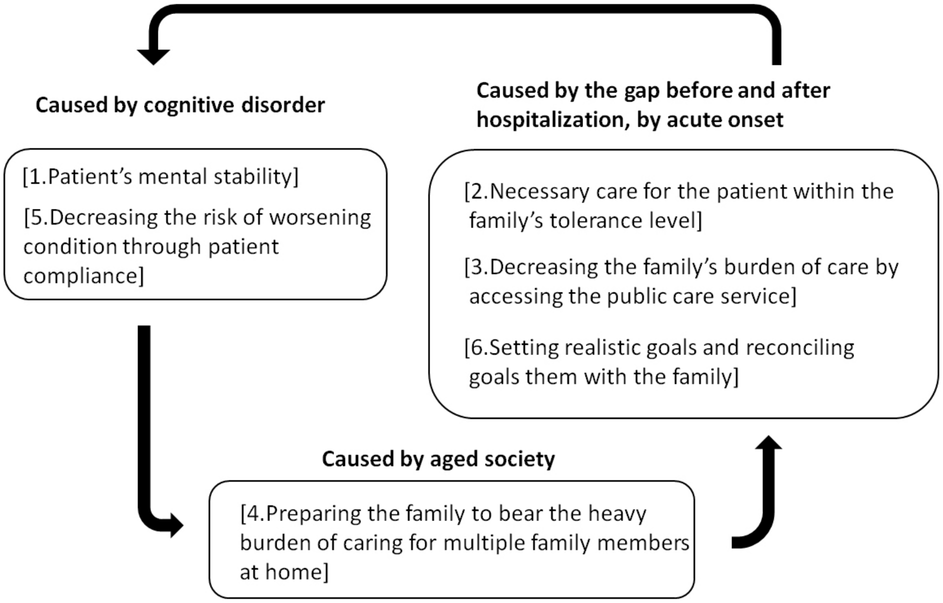

Figure 4. Causes of problems related to the six requirements

4.2 Fulfillment of the six requirements

Among the six requirements, [Patient's mental stability] showed that reducing patients' violent and risky behavior allows patients to begin the rehabilitation process, and the family to consider the person coming home and providing care. Therefore, this requirement is a precondition for transition to home.

[Necessary care for the patient within the family's tolerance level] shows the need for maintaining a balance between the patient's independent activities of daily life and the family's care ability and energy, by increasing the patient's physical ability and/or family's care ability, or narrowing the patient's range or decreasing the patient's physical ability to reduce the burden of care by family. [Decreasing the family's burden of care by accessing the public care service] shows the need for entering the public care service to prevent concentration of the burden on one main caregiver in the family. Therefore, these two requirements ensure concrete preparation for home care.

[Preparing the family to bear the heavy burden of caring for multiple family members at home] shows the need for one main caregiver in the family who decides to bear the burden of care for the family members. [Setting realistic goals and reconciling them with the family] shows the need to find common ground among family to cope with limitations of home care. These two requirements help develop the family's mental framework for home care.

[Decreasing the risk of worsening condition through patient compliance] shows that the family must develop new and specialized skills to cope with new symptoms of the patient. Therefore, this requirement includes coping with new tasks.

Therefore, to fulfill the six requirements for successful transition to home care, we must engage in concrete preparation, prepare the family mentally for home care, and cope with new tasks (see Figure 5).

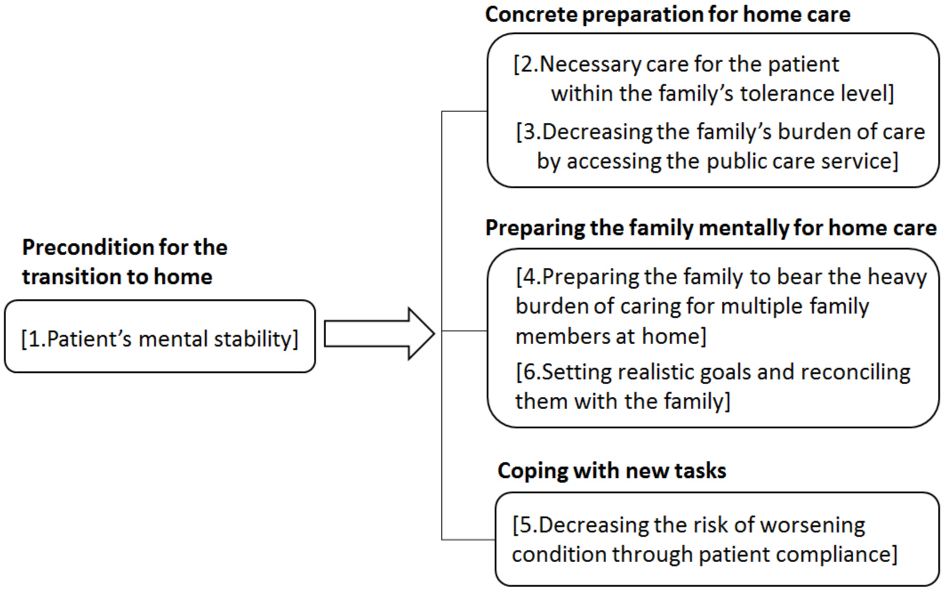

Figure 5. Fulfillment of the six requirements

4.3 Demographic data by amicable and non-amicable settlement cases

Figure 2 shows demographic data for amicable and non-amicable settlement cases (n = 41 patients), and Figure 3 shows demographic data regarding the six requirements (n = 54 nursing interventions for promoting transition).

More than half of the 41 patients (25 patients, 61%) were amicable settlement cases. In returning home (23 patients, 56.1%), amicable settlement cases accounted for 15 patients (36.6%), while non-amicable settlement cases accounted for 8 patients (19.5%). Non-amicable cases coming home (8 patients, 19.5%) were high-risk cases with heavy burden on the family and changes in the patient's sense of worth; therefore, follow-up and support must be provided for those who return home after non-amicable settlements.

Next, we discuss sex, age, and disease. Amicable settlement cases made up more than half of those in their 80s or younger (amicable settlement cases = 10 patients, 24.4%; non-amicable settlement cases = 5 patients, 12.2%), those in their 90s (amicable settlement cases = 12 patients, 29.3%; non-amicable settlement cases = 5 patients, 12.2%), females (amicable settlement cases = 18 patients, 43.9%; non-amicable settlement cases = 5 patients, 12.2%), and those in orthopedics (amicable settlement cases = 15 patients, 36.6%; non-amicable settlement cases = 6 patients, 14.6%). On the other hand, non-amicable cases made up half or more than half of those in their 70s (amicable settlement cases = 1 patient, 2.4%; non-amicable settlement cases = 5 patients, 12.2%), males (amicable settlement cases = 7 patients, 17.1%; non-amicable settlement cases = 11 patients, 26.8%), those in neurology (amicable settlement cases = 10 patients, 24.4%; non-amicable settlement cases = 10 patients, 24.4%). In addition, those with problems regarding [Patient's mental stability] in Figure 3 were all male. This result suggests that the reasons for difficulty in returning home are related not to super aging but to sex and problematic behavior; thus, the family may find difficulty in providing home care to males with violent and risky behavior. According to a national survey in Japan,[2] the main caregiver in the family is the spouse (26.2%), child (21.8%), spouse of child (11.2%), and women (68.7%); and those in their 60s (31.0%), 70s (24.8%), 50s (21.4%), or 80s or above (12.8%). Thus, the main caregivers are elderly wives, daughters, and daughters-in-law, and the structure of relying on care from older women, who have less power, is related to the difficulty with caring for males who are bigger and stronger. On the other hand, a meta-synthesis of qualitative studies showed that successful care for dying at home required a deep bond between the patient and family.[19] If patients have strong bonds with their family due to living with them for a long time, they may be able to return home even if they are extremely old.

Regarding family construction, many patients with non-amicable settlements were living with only their spouse (amicable = 5 patients, 12.2%; non-amicable = 5 patients, 12.2%) and single child (amicable = 4 patients, 9.8%; non-amicable = 5 patients, 12.2%). On the other hand, non-settlement cases living alone (amicable = 5 patients, 12.2%; non-amicable = 1 patient, 2.4%), with a child and his or her spouse (amicable = 5 patients, 12.2%; non-amicable = 1 patient, 2.4%), and with three or four generations (amicable = 4 patients, 9.8%; non-amicable = 1 patient, 2.4%) were few. Living alone, living with only a spouse, and living with a single child offers fewer resources in terms of the presence of a caregiver compared to living with a married child, or with three or four generations. Interestingly, living alone was rarely seen in non-amicable settlements, while living with only a spouse and living with single child was common in non-amicable settlement. Patients living alone may be able to accept the idea of coming home easily, because they do not have a caregiver at home, but the presence of a spouse or single child at home may make giving up this idea more challenging. Further, patients may relinquish responsibility and give effort as the family caregiver, if they have many burden as caregiver. Although we have considered over work against old spouse, we have overlooked and not be able to notice about falling over work against single child as caregiver. There is little research about filial care.[20] Addressing the challenges of a single child as caregiver is critical as they will be an increasing proportion of the population, as lifetime single (non-married) rate in Japan rises.[21] While many single children may have a strong bond with the patient and hope to provide home care, they may face conflicts between providing care and continuing their job.[20] Thus, we must consider how to support single children to prevent their loss of income and the risk of poverty.

4.4 Characteristics of the demographic data about the six requirements

We showed demographic data about the six requirements in Figure 3. [Necessary care for the patient within the family's tolerance level] had more non-amicable settlement cases (amicable = 3 patients, 5.6%; non-amicable = 6 patients, 11.1%) while other categories showed more amicable settlement cases than non-amicable. This requirement appears to be more difficult than the other requirements. This requirement has three subcategories: <3) Increasing the patient's activities of daily life and family's care skills> is difficult to fulfill, because recovery of the patient's physical function is limited, and many caregivers are aging women, and their power and energy to care is less. <5) Intentionally decreasing the patient's ability to perform activities to decrease the family's burden of caring for a wandering patient and being able to provide care in the home by aging family.> infringes on the principle of beneficence and non-maleficence of medical ethics,[22] because the patient's quality of life decreases, although the family decided to select strategies under the pressure of necessity. Therefore, we must consider new strategies for fulfilling this requirement, for example: <4) Intentionally making time to develop and achieve care skills by family>, which do not involve ethical problems and are good strategies.

[Decreasing the risk of worsening condition through patient compliance] was the most reported (31.5%) among the six requirements, and going to nursing homes after discharge (13.0%) into 31.5% total. Regarding the demographic characteristics of these requirements, female (22.2%), orthopedic disease (18.5%), living alone (9.3%), and moderate degree (22.2%) at necessary care at discharge were greater. However, according to Figure 2, female, orthopedic disease, and living alone was seen in many amicable settlement cases, but nursing care level was not related with amicable or non-amicable settlement case. This suggests that entering nursing homes is selected to protect the patient's worsening physical condition by noncompliance and repeatedly falls. If the family has skills and uses effective tools for promoting compliance, returning home will become more common.

4.5 Further research

Based on our findings, further research is required in the following areas: 1) how to assess and support returning home in non-amicable cases, and how to identify who is at most risk for experiencing the burden of care and coping with the patient's worsening condition; 2) how to decrease the burden of old, aging women from caring for men with risky and violent behaviors; 3) how to assess and decrease the burdens of families with less manpower, especially families with a single child, so that the child's life and future can be protected from the burden of care; 4) what new strategies are required to balance necessary care for the patient and the family's tolerance level; and 5) what new strategies are required for families to ensure compliance and risk aversion instead of patients with cognitive disorder, for example, educational method for promoting family's skills and development of new devices; and 6) developing medical and welfare social systems to solve above problems.

4.6 Evaluation of newly developed methodology for qualitative data

We developed the methodology used for case study analysis (see Figure 1). Our methodology begun by patients' medical records to obtain all the information corresponding to the inclusion and exclusion criteria within a certain time period, without manipulation. The strength of using medical records is that identification of nursing interventions is straightforward. However, the disadvantage is that the primary purpose of medical records is to provide clinical care, not research. Thus, there may be a shortage of data. The importance of utilizing medical records, particularly nursing records in research should be highlighted, and we would recommend that nursing records should be written in detail to fully understand patients' care and needs.

Additionally, this methodology was a mixed method design with qualitative and quantitative analysis. We examined demographic data for the amicable or non-amicable settlement cases, and for the six requirements of transition, which were extracted by qualitative analysis. By using mixed methods, we could suggest further research questions and implications for clinical intervention. Quantitative analysis of demographic data after qualitative analysis was possible because a large amount of data was obtained through medical records. It is usually difficult to gather this much qualitative data from patients by interview. Fewer cases are needed to identify concepts because theoretical saturation will be achieved with interview data for a small number of cases. Medical records make it easier to use mixed methods, which can extract the essence of a case and show the tendency of demographic data.

The third characteristic of our methodology is identifying a new analysis procedure for case study. In the characteristics of the methods, the first elucidates the reality of amicable and non-amicable settlement cases by each detailed case analysis. The second is that the requirements were extracted from the real amicable and non-amicable settlement cases. Thus, the six requirements are universal and reflect the reality. The third includes summarizing each case's situation, intervention, and result of the intervention against each requirement, and concrete strategies for meeting each requirement are shown. We show not only universal, essential elements, but also concrete strategies for supporting patients. The strength of our qualitative procedure is that 1) there is consistency between the study purpose and methodology, 2) the reality of the cases was described in the six requirements, 3) universal, essential elements were described in the six requirements, and 4) concrete strategies were shown for meeting the six requirements. We should continue to develop new case study methodology, because predecessors have suggested that the case study was based on understanding chaotic phenomenon and developing new nursing skills, but the methodology of case study did not develop.[23]

4.7 Limitations and strengths of this study

The first limitation is that the requirements identified by this study were influenced by factors influencing Japanese culture, such as shifts in the population, family structure and culture, and medical and welfare system. Second, this study used a retrospective design utilizing patients' medical records. Since medical records are written for clinical purposes rather than explicitly for this study, we may have incomplete data. Third, the data is specific to orthopedics and neurosurgery, and may not generalize to other populations.

However, this study has a number of strengths. First, the study took place in the area of Japan with the highest aging population. Second, all data over a one year period was analyzed. Therefore, this study could have implications for aged societies worldwide.

5. CONCLUSIONS

To clarify the requirements for the transition of aging patients with cognitive and physical disorders to home care, we collected medical record data and used an original method of analysis. The identified requirements included [Patient's mental stability], [Necessary care for the patient within the family's tolerance level], [Decreasing the family's burden of care by accessing the public care service], [Preparing the family to bear the heavy burden of caring for multiple family members at home], [Decreasing the risk of worsening condition through patient compliance], and [Setting realistic goals and reconciling them with the family].

The six requirements are related to cognitive disorders, gap of patient's physical function before and after hospitalization, and aged society. They are fulfilled by concrete preparation of the family's mindset for home care and coping with new tasks, based on mental stability as the precondition for transition to home.

ACKNOWLEDGEMENTS

Thank you to the patients for permission to use their medical records for this study.

CONFLICTS OF INTEREST DISCLOSURE

The authors declare they have no conflicts of interest.

REFERENCES

[1] Tokyo Medical Organization. Characteristic of physical function and disease of aging person. Tokyo, Japan: Tokyo Metropolitan Medical Association; 2017. Available from: `http://www.tokyo.med.or.jp/kaiin/kaigo/chiiki_care_guidebook/035_072_chapter02.pdf`

[2] Ministry of Health, Labour and Welfare. Current status public long-term care insurance system and role of the future. Tokyo, Japan: 2017. Available from: `http://www.mhlw.go.jp/file/06-Seisakujouhou-12300000-Roukenkyoku/201602kaigohokenntoha_2.pdf`

[3] Ninomiya T. A study about future population estimate of aging dementia in Japan. Japan: Ministry of Health, Labour and Welfare Grants System; 2014. Available from:

https://mhlw-grants.niph.go.jp/niph/search/NIDD00.do?resrchNum=201405037A

[4] Ministry of Health, Labour and Welfare. Japanese dementia strategy. New Orange Plan; from 2013 to 2017. Available from: http://www.mhlw.go.jp/english/index.html

[5] Cabinet Office, Government of Japan. Annual report on the aging society: 2016. Tokyo, Japan: Cabinet Office, Government of Japan. 2016. Available from: http://www8.cao.go.jp/kourei/whitepaper/w-2015/html/gaiyou/s1_2_3.html

[6] United Nations Organization. World Population Prospects the 2012 Revision: Highlights and Advance Tables. New York, New York, USA: Department of Economic and Social Affairs: Population Division. Working Paper No. ESA/P/WP.228; 2013. Available from: https://esa.un.org/unpd/wpp/publications/Files/WPP2012_HIGHLIGHTS.pdf

[7] McGrother CW, Jagger C, Clarke M, et al. Handicaps associated with incontinence: implications for management. J Epidemiol Community Health. 1990 Sep; 44(3): 246-248. PMid: 2148771. https://doi.org/10.1136/jech.44.3.246

[8] Iwai N, Aoyagi Y. ADL Structure of stroke and femoral neck fracture elderly patients with dementia analyzed by degree of independence in ADL for the Ministry of Health, Labour and Welfare. Rigakuryoho Kagaku. 2014 Mar; 29(1): 123-129. https://doi.org/10.1589/rika.29.123

[9] Kamayama Y, Inoue K. Proximal femoral fracture in elderly patients with dementia and associated ADL: Focusing on severity and psychiatric symptoms. The Journal of Japanese Occupational Therapy Association. 2011 Aug; 30(4): 455-465.

[10] Nakano H, Mizuseki T, Yoshimura O, et al. Femoral neck fracture in highly aged patients with dementia. J Phys Ther Sci. 2000 Jan; 12(1): 33-38. https://doi.org/10.1589/jpts.12.33

[11] Watanabe M. The relationship between hospital days length of stay, dementia and pain after artificial bone head replacement surgery. Journal of Japanese Society for Fracture Repair. 2012 Jan; 34(1): 105-108.

[12] Fukui A, Furuki E, Shindou H. Eating training for the patient with severe dementia and left hemiplegia: A case in which improved mental function occurred. The Journal of Japanese Occupational Therapy Association. 2004 Jun; 23(3): 252-260.

[13] Okada K, Yamasaki U, Yamasaki O. Effect of sitting up and rolling training using backward-chaining technique for a severe hemiplegia patient with dementia. Behavioral Rehabilitation. 2015; 16: 13-16.

[14] Kraijo H, de Leeuw R, Schrijvers G. How spouses evaluate Nursing Home Placement of their demented partner: A study about the end of perseverance time. Scand J Caring Sci. 2015 Mar; 29(1): 101-109. PMid: 24698027. https://doi.org/10.1111/scs.12137

[15] Lilly MB, Robinson CA, Holtzman S, et al. Can we move beyond burden and burnout to support the health and wellness of family caregivers to persons with dementia? Evidence from British Columbia, Canada. Health Soc Care Community. 2012 Jan; 20(1): 103-112. PMid: 21851447. https://doi.org/10.1111/j.1365-2524.2011.01025.x

[16] Zabaleguia A, Hamers JPH, Karlsson S, et al. Best practices interventions to improve quality of care of people with dementia living at home. Patient Educ Couns. 2014 May; 95(2): 175-184. PMid: 24525223. https://doi.org/10.1016/j.pec.2014.01.009

[17] Simane Prefecture Office. Aging rate of Shimane Prefecture. Matsue, Japan: Shimane Prefectural Government, Shimane Prefecture Public Relations Department. 2017. Available from: http://www.pref.shimane.lg.jp/medical/fukushi/kourei/kourei_sien/toukei/agerate.html

[18] Ministry of Education, Culture, Sports, Science and Technology, & Ministry of Health, Labour and Welfare. Ethical guidelines for medical research against human. 2014. Available from: http://www.mext.go.jp/b_menu/houdou/26/12/__icsFiles/afieldfile/2014/12/22/1354186_1.pdf

[19] Kondo R, Kondo M. Strategies for enabling high-quality home care for dying cancer patients in Japan: a meta-synthesis of the literature. Journal of Nursing Care. 2016; 5(Suppl): 10.

[20] Campbell LD. Sons who care: Examining the experience and meaning of filial caregiving for married and never-married sons. Can J Aging. 2010 Mar; 29(1): 73-84. PMid: 20202266. https://doi.org/10.1017/S071498080999033X

[21] Cabinet Office, Government of Japan. Declining Birthrate Write Paper. Tokyo, Japan: Cabinet Office, Government of Japan; 2015. Available from: https://rnavi.ndl.go.jp/politics/entry/JGOVe-hakusyo.php

[22] Beauchamp TL, Childress JF. Principles of Biomedical Ethics, 3rd ed. Oxford: Oxford University Press; 1989.

[23] Toguchi T. Hoho to shite no Jirei kento. Tokyo: Japanese Nursing Association Publishing Company; 1981. Japanese.