



# The Initial Factors Promoting Long-Term Care Health Facility Inpatients to Return Home: Examination Focusing on the Number of Family Visits through Research and Intervention

Shimano, Koichi

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# 博士論文

The Initial Factors Promoting Long-Term Care Health Facility Inpatients to Return Home:  
Examination Focusing on the Number of Family Visits through Research and Intervention

(介護老人保健施設利用者の自宅退所への端緒  
～調査と介入による家族面会数に着目した検討～)

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Koichi Shimano (嶋野 広一)

# The Initial Factors Promoting Long-Term Care Health Facility Inpatients to Return Home: Examination Focusing on the Number of Family Visits through Research and Intervention

Koichi Shimano<sup>1,2</sup>, Toru Nagao<sup>3</sup>, Kenichi Hanafusa<sup>4</sup>,  
Suguru Fukuzawa<sup>5</sup>, Shigeki Furuyama<sup>6</sup>

## Abstract

The number of inpatients returning home after being discharged from long-term care health facilities is declining, with the opinions and presence of family members being attributed to this trend.

In Study 1, we focused on family members' visits to such long-term care health facilities in order to understand the involvement between inpatients and family members. We hypothesized that inpatients with family members who visit them frequently are more likely to return home. The results revealed that the home group had more visits two weeks after admission than did the medical group.

Study 2, we attempted interventions to increase the number of family visits and return home. The results indicated that the number of family visits was found to be higher in the intervention group than the control group; however, there was no difference in the number of home returns between the two groups. The requirements for inpatients to return to their homes include the absence of medical need and their families' desire for inpatients to return to their homes.

However, we expect that increased opportunities for inpatients and family members to interact will create a shift in the mindset of the both inpatients and family members and increase their sense of affinity.

## Key Words

Long-Term Care Health Facility, Family Visits, Returning Home

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<sup>1</sup> Department of Occupational Therapy, Osaka Kawasaki Rehabilitation University

<sup>2</sup> Doctoral program, Graduate School of Health Sciences, Kobe University

<sup>3</sup> Kobe University Graduate School of Health Sciences

<sup>4</sup> Faculty of Health Sciences, Mejiro University

<sup>5</sup> Kobe Oyama Hospital

<sup>6</sup> Kita-harima Medical Center

## **Introduction**

Long-term care insurance in Japan is broadly classified into home service and facility service. Long-term care health facilities (hereinafter, “facilities”) offer stay care. In addition facilities offer day care for patients who return home everyday. These services support the independence of elderly people who need care but intend to stay at home or return home, and functions as an intermediate facility between the medical setting and home setting.

When long-term care insurance was first introduced in 2000, approximately 45% of facility inpatients were discharged to home. In contrast, in 2016, the rate of discharge to home had declined to about 29%<sup>1)</sup>. In surveys conducted by the Japan Association of Long-Term Care Health Facilities on the declining rate of discharge to home<sup>2)</sup>, 86% of inpatients indicated that their family influenced their discharge destination. Moreover, the survey results suggest that in many cases the family did not want the inpatient to be discharged to home or that the inpatients themselves believed they would be an inconvenience to the family upon returning home. Thus, the opinion and existence of “family” was highly regarded by inpatients being discharged to home.

In order to understand the involvement between family members and inpatients, we focused on family visits to the inpatients. Since there are few studies on the involvement between family members’ visits to inpatients’ facilities and the returning home of inpatients, we conducted a study to verify our hypothesis of whether inpatients whose family came to visit often would be more likely to return home.

This research was conducted in two parts. In Study 1, we aimed to examine the number of visits of the home group (those who were discharged from a facility to home) and the medical care group (those who were discharged from a facility to a medical institution). The objective of Study 2, based on the results of Study 1, was to conduct interventions targeting families in order to increase the number of visits and examine its influence on inpatients’ discharge to home.

## **Methods**

### **1. Study 1**

#### **1)Subjects**

In 2012, the Long-Term Care Insurance System was revised in reference to the status of discharge to home and the bed turnover rate. Facilities were classified into three types: home return support, home recuperation support services, and conventional services<sup>3)</sup>. This revision was implemented to strengthen the discharge for home function. Three long-term care health facilities were surveyed for the present study: Osaka Prefecture: 2 facilities, Hyogo Prefecture: 1 facility. These facilities comprised one home recuperation support services type facility and one conventional facility (Osaka Prefecture), and one home recuperation support service type facility (Hyogo Prefecture; Table 1).

These facilities were chosen because their reception areas were on the first floor, they required on-the-spot completion of visitor records, and they encouraged completion of the visitor records.

Considering that place of residence might be an influential factor for discharge to home, we selected one facility in a suburban area (Facility A) and one in an urban area (Facility B) in Osaka. From Hyogo we selected a facility in an urban area (Facility C).

Participants comprised 138 older adults ( $85.3 \pm 7.3$  years) discharged from the three facilities over the one-year study period (Table 1).

Table 1. Facilities surveyed in Study 1

	Facility A	Facility B	Facility C
Location	Osaka Pref.	Osaka Pref.	Hyogo Pref.
Survey period	July 2013 to June 2014	October 2013 to September 2014	April 2014 to March 2015
Number of participants	45	48	45
Location	Suburb	Urban area	Urban area
Features	Conventional type	Support services type	Support services type

\*Facility selection criteria

- Reception should be on the first floor
- Must have visitors complete the visitor records at the reception
- Must encourage visitors to complete visitor records

## 2)Methods

The survey items for the 47 participants in the home group (mean age  $85.0 \pm 7.2$  years) and 91 participants in the medical group (mean age  $85.5 \pm 7.3$  years) assessed degree of care<sup>4)</sup>, degree of independence<sup>4)</sup>, degree of cognitive impairment<sup>4)</sup>, and length of stay. This information was obtained from the inpatients' clinical records and care plans. Scores for the degree of independence ranged from 9 (independent) to 1 (C2) and scores for degree of cognitive impairment ranged from 1 (no awareness) to 10 (M) (Tables 2 ,Table 3). In addition, we counted the number of visits during the two-week period after admission and the two-week period prior to leaving the facility. We obtained the number of visits from the visitor records filled by the families. Only visits by family members or blood relatives of the inpatient were counted; visits by friends, medical staff, or welfare workers were not included. For multiple visits in the same day, each visit was counted.

Table 2. Criteria for evaluating the degree of independence of bedridden older adults in performing activities of daily living<sup>4)</sup> and the scores used for statistical processing

Rank	Judgment criteria	Scores	
Independent living	Has some disability but is mostly independent in daily life and can go out independently		
	J 1	Can go out using public transport	8
	2	Can go out in the neighbourhood	7
Partially bedridden	Lives independently indoors but requires assistance to go out		
	A 1	Goes out with assistance, stays out of bed most of the day	6
	2	Seldom goes out and often rests in bed during the day	5
Bedridden	Requires some assistance living indoors and spends most of the day in bed, but can sit up		
	B 1	Uses a wheelchair to move about, but gets up for meals and to go to the toilet	4
	2	Requires assistance to transfer to a wheelchair	3
	Spends all day in bed and requires assistance for excretion, meals, and dressing		
	C 1	Can turn over in bed unassisted	2
2	Cannot turn over in bed unassisted	1	

\*Independence score: 9

Table 3. Criteria for evaluating the degree of independence in bedridden older adults with cognitive impairment in performing activities of daily living <sup>4)</sup> and the scores used for statistical processing

Rank	Judgment criteria	Examples of symptoms and behaviour	Scores
I	Has some degree of cognitive impairment but lives mostly independently at home and in the community		2
II	Shows some symptoms/behaviour or some difficulty in communication interfering with daily life, but can be independent with assistance		3
I a	Shows the symptoms mentioned in II outside home	Frequently gets lost, makes mistakes during shopping, office work, money management, etc.	4
II b	Shows the symptoms mentioned in II at home as well	Is unable to independently take medicines, answer phone calls, or manage visitors at home	5
III	Shows symptoms/behaviour and difficulty in communication interfering with daily life, requiring nursing care		6
III a	Shows the state mentioned in III mainly in the daytime	Is unable to skilfully change clothes, eat, defecate, and urinate, taking more time than normal. Puts random objects in the mouth. Gathers objects, loiters, has incontinence, speaks in a loud voice, shouts in a strange voice, is careless with fire, displays obscene behaviour, abnormal sexual conduct, etc.	7
III b	Shows the state mentioned in III mainly in the night	Same as rank III a	8
IV	Frequently shows symptoms/behaviour and difficulty in communication interfering with daily life, requiring constant nursing care	Same as rank III	9
M	Shows significant psychiatric and peripheral symptoms or severe physical symptoms, requiring specialized medical care	Shows continuous peripheral symptoms caused by psychiatric symptoms like delirium, delusion, agitation, self-injury, and harming others	10

\*Score for no degree of cognitive impairment: 1

### 3) Analysis method

To understand the attributes and characteristics of both groups, descriptive statistics were calculated and compared for age, degree of care, degree of independence, degree of cognitive impairment, number of visits after admission, length of stay, and number of visits before being discharged.

Since the number of visits after admission and before discharge did not show a normal distribution during statistical processing, Mann-Whitney's U-test was conducted to compare the groups. Statistical analysis was performed using SPSS, Version23, with a significance level of less than 5%.

#### 4)Ethical considerations, etc.

The studies were conducted in accordance with the ethical guidelines<sup>5)</sup> on epidemiological studies established by the Ministry of Education, Culture, Sports, Science and Technology and Ministry of Health, Labour and Welfare, after obtaining ethical approval from the Osaka Kawasaki Rehabilitation University (approval no: OKRU26-A219).

## 2.Suudy2

### 1)Subjects

We conducted an intervention study at facilities fostering return to home (Osaka Prefecture: 1 facility, Wakayama Prefecture: 1 facility) (Table 4). The facility selection criteria were the same as for Study 1, with one suburban facility in Osaka (Facility D) and one facility in an urban area within Wakayama Prefecture (Facility E) (Table 4). Facilities A and D in the Table are the same institutes(Table 1,Table 4).

Participants comprised 86 patients (intervention: 38 persons, control: 48 persons) from two facilities admitted during the five-month intervention/control period (new admissions or patients discharged during the five-month study period were excluded).

Table 4. Facilities surveyed in Study 2

	Facility D	Facility E
Location	Osaka Pref.	Wakayama Pref.
Intervention period	November2017 to March 2018	May 2018 to September 2018
Control period	May 2018 to September 2018	November 2017 to March 2018
Number of participants	48	38
Location	Suburb	Urban type
Features	Facilitating discharge to home	Facilitating discharge to home

\*Facility selection criteria

- Reception should be on the first floor
- Must have visitors complete the visitor records at reception
- Must encourage visitors to complete visitor records

\*Facility A is the same as Facility D but has different features; it transitioned into a home return facilitating type geriatric facility in November 2016.

### 2)Methods

To increase the number of family visits, we introduced a stamp card based on the token economy method<sup>6)</sup>. The token economy method allows individuals to perform desired actions (visits), receive tokens (gifts) as rewards, and encourages individuals to perform targeted actions (visits) more frequently. In Japan, people can easily partake in activities such as radio calisthenics every morning during summer vacations and getting their cards stamped for gifts<sup>7)</sup>. People experience a sense of accomplishment from collecting stamps and it comes instinctively to them because these stamps are also used in retail shops to attract customers<sup>8,9)</sup>. Even in the field of education, introducing a point system for lectures significantly improved lecture attendance and increased the lectures' efficiency<sup>10)</sup>. There is a serious shortage of care

staff at facilities in Japan<sup>11)</sup>. Promoting visits by arranging events substantially burdens the staff. Therefore, visiting stamp cards are a better alternative because they are versatile and feasible for use at multiple facilities. Given that family was believed to be able to directly check the state of the inpatients, an attempt was made to increase the number of visits by family members. Additionally, frequent interaction between inpatients and families is likely to enhance the consciousness of both parties and increase their sense of affinity. In psychology, this is known as the mere-exposure effect<sup>12)</sup>, a phenomenon by which people tend to develop a preference for things merely because they are familiar with them<sup>13)</sup>. In other words, an increase in the number of visits may maintain and improve the sense of affinity between inpatients and their families and prevent declining awareness and responsiveness because of estrangement.

The intervention group was given cards that were stamped on every visit made to the inpatient and received a gift after collecting four stamps, while the control group made regular visits. The stamp cards listed the purpose of the visit (laundry replacement, payment of facility bills, checking on inpatient, called by inpatient, stopped on the way, or other) and the families were asked to select all the applicable reasons for the visit. The distributed gifts were consumable goods worth JPY 100 available at retail stores. In an effort to boost families' motivation to collect stamps and receive gifts, the stamp cards were distributed with "visited" already stamped for the first visit.

The intervention period and the control period were both set as five months in consideration of the median residency period of home return facilitating-type geriatric facilities (203.1 days)<sup>14)</sup> and the long-term care insurance revision made in April 2018. Therefore, the first half of the period was set as November 2017 to March 2018, and the second half from May to September 2018 (Figure 1).

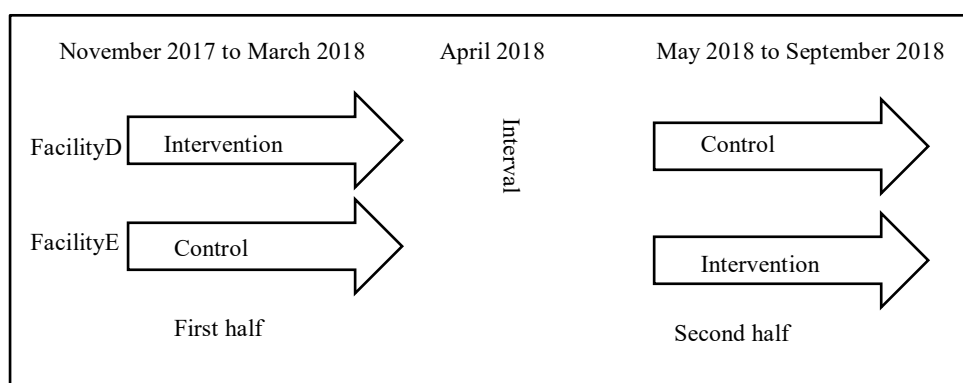


Figure 1. Intervention schedule

### 3) Analysis method

In order to understand the attributes of the 86 subjects, the number of family members and the difference between inpatients living alone or inpatients living together with their family was confirmed using a parametric test. This is because these variables, which were believed to impact the number of



visits, did not show a normal distribution. The number of family members and the number of visits were compared using Spearman's rank correlation coefficient. The number of visits between inpatients living alone (41 people) and those living with family members (45 people) and the existence of a spouse (Yes: 22, No: 64) were compared using Mann-Whitney's U-test

For the comparison of the number of visits in terms of the existence of intervention, the two groups were compared using Mann-Whitney's U-test for analysis, a non-parametric test. This is because the number of visits, the number of family members, the degree of care, the degree of independence, and the degree of cognitive impairment of each group did not show a normal distribution. A chi-squared test was used to evaluate the difference in the existence of a spouse between the intervention group and the control group. In addition, given that adjusted factors in Study 1 had the possibility of becoming confounding factors, a multiple regression analysis was conducted with the number of visits as the dependent variable, and age, number of family members, degree of care need, degree of independence, and degree of cognitive impairment as independent variables. The forced injection method was performed when conducting the multiple regression analysis.

A chi-squared test was conducted on the difference in discharged destination (home or a medical institution) of those who had been discharged from a facility (intervention: 12, control: 14).

Statistical analyses were performed using IBM SPSS Statistics Version 23, with a significance level of less than 5%.

#### **4) Ethical considerations, etc.**

The studies were conducted in accordance with the ethical guidelines<sup>5)</sup> on epidemiological studies established by the Ministry of Education, Culture, Sports, Science and Technology and Ministry of Health, Labour and Welfare, after obtaining ethical approval from the Osaka Kawasaki Rehabilitation University (approval no: OKRU29-A014).

## **Results**

### **1. Study 1 Results**

We visited each facility in order to collect data, such as number of visits. However, at one facility, we were unable to obtain data for the entire study period owing to management policies. Data were available only for the number of visits occurring in the two weeks after admission and two weeks prior to discharge. Thus, this data were collected from all facilities and analysed.

The results indicated that the median number of family visits during the two weeks after admission was significantly higher for the home group compared to the medical care group ( $p < 0.05$ ). The home group had a median of two family visits after admission (range: 1 to 7) and two visits two weeks prior to leaving the facility (range: 0 to 5). In contrast, the medical care group had one visit after admission (range: 0 to 4) and one visit two weeks prior to leaving the facility (range: 0 to 3). Length of

stay did not differ between the groups (Table 5). Degree of care, degree of independence, and degree of cognitive impairment were significantly different between the two groups, with the home group scoring lower on degree of care and degree of cognitive impairment, and higher on the degree of independence compared to the medical group (Table 6).

In addition to the anticipated finding that inpatients who returned home had a high degree of independence and did not need much care, we also found that these inpatients had a high number of visits from the family. Since the number of visits appeared to be a significant factor influencing inpatients' likelihood of returning home, we developed Study 2, which investigated the visits from the inpatients' families.

Table 5. Age of participants and frequency of family visits 2 weeks after admission and 2 weeks prior to leaving the facility

Discharge destination	Age (years)	Length of stay (days)	Visits after admission	Visits prior to leaving facility
Home (n = 47)	85.0±7.2	111(63-196)	2(1-7)	2(0-5)
Medical institution (n = 91)	85.5±7.3	106(57-216)	1(0-4)	1(0-3)
p-value	0.695	0.896	0.035	0.175

\*Median (interquartile range)

Table 6. Degree of care, degree of independence, and degree of cognitive impairment based on discharge destination

Discharge destination	Degree of care	Degree of independence	Degree of cognitive impairment
Home (n = 47)	3(2-4)	4(3-6)	5(5-8)
Medical institution (n = 91)	3(3-4)	3(3-4)	7(5-8)
p-value	0.006	0.009	0.006

\*Median (interquartile range)

## 2. Study 2 Results

There was a weak positive correlation between the number of family members in the inpatients' family and the number of visits (Table 7). There were no significant differences in the number of visits to persons living alone versus persons living with family based on the number of visits to persons with and without partners (Tables 8, Table 9).

There were no differences in the number of family members, degree of care needed, degree of independence, and degree of cognitive impairment between the intervention and control groups (Table 10). The median number of visits was 27 (range: 15-49) times for the intervention group and 11 (range: 5-21) times for the control group, with the intervention group having more visits than the control group ( $p < 0.01$ ) (Table 11). A multiple regression analysis was conducted with the number of visits as the

dependent variable, and the age, number of family members, degree of care needed, degree of independence, and degree of cognitive impairment as independent variables. As a result, the adjusted coefficient of determination was 0.051, producing a regression equation with a poor fit. The p-value of the number of family members was 0.021, which could be considered a variable with an explanatory power. However, it was determined that the degree of care needed, degree of independence, and degree of cognitive impairment did not have any explanatory power (Table 12).

Table 7. Correlation coefficients for the number of family members and family visits (n = 86)

	Family visits
Number of family members	0.283
p-value	0.008

Table 8. Family visits based on older adults living alone and living with family

	Number of older adults	Family visits
Living alone	41	19(6-31)
Living with family	45	15(7-46)
p-value		0.809

\*Median (interquartile range)

Table 9. Family visits based on presence/absence of partner

	Number of older adults	Family visits
Has a partner	22	19(8-62)
Does not have a partner	64	17(6-29)
p-value		0.272

\*Median (interquartile range)

Table 10. Age, existence of a spouse, number of family members, number of cohabitants, degree of care needed, degree of independence, and degree of cognitive impairment of intervention and control groups

	Age (years)	Number of family members	Number of cohabitants	Degree of care	Degree of independence	Degree of cognitive impairment
Intervention group (n=38)	87.1±6.6	5(3-6)	2(1-3)	4(3-4)	4(3-4)	7(5-9)
Control group (n=48)	85.4±8.1	4(3-5)	2(1-2)	4(2-4)	4(3-4)	7(7-9)
p-value	0.749	0.061	0.3604	0.939	0.856	0.812

※ The median values (interquartile range) is used for the number of family members, number of cohabitants, degree of care, degree of independence, and degree of cognitive impairment.

\*Median (interquartile range)

Table 11. Number of visits of the intervention and control groups

	Number of visits
Intervention group (n=38)	27(15-49)
Control group (n=48)	11(5-21)
p-value	0.000

\*Median (interquartile range)

Table 12. Multiple regression analysis between visits and age, number of family members, degree of care, degree of independence, and degree of cognitive impairment

Variable name	Partial regression coefficient	Standard regression coefficient	t-value	p-value	Single correlation
Age	0.823	0.175	1.626	0.108	0.154
Number of family members	4.055	0.253	2.353	0.021	0.213
Degree of care needed	6.574	0.218	1.474	0.144	0.129
Degree of independence	2.650	0.104	0.734	0.465	-0.025
Degree of cognitive impairment	0.185	0.012	0.091	0.928	0.064
Constant term	-92.279		-1.841	0.069	
Modified coefficient of determination	0.051				

Twenty-six inpatients have been discharged from the facilities since April 2018 and since October 2018. There was no significant difference between discharge to home and discharge to hospital (Table 13).

As for the purpose of visit in the intervention group, 73.0% (137 cases) selected “check on the inpatient” (Table 14).

Table 13. Number of older adults and type of discharge destination in intervention and control groups

	Home (elderly)	Hospital (elderly)	Total (elderly)
Intervention	8	4	12
Control	8	6	14
p-value			0.619

Table 14. Purpose of visit by family members

	Family visits	Percentage (%)
Laundry exchange	32	23.4
Payment of facility bills	2	1.5
Check on state of inpatient	100	73.0
Called by inpatient	0	0
Stopped on the way	2	1.5
Other	1	0.7
Total	137	100

## Discussion

### 1. Family Visits

In this study, the number of visits by the inpatients' family members was examined in Study 1. It was found that the number of visits by the inpatients' family within the two-week period after admission was higher among the home group ( $p < 0.05$ ). If the number of visits is higher, the involvement between inpatients and their families will be maintained, and alienation can be expectably prevented. In other words, it is considered that the large number of visits affects the simple contact effect, which leads to inpatients returning home.

Kaneda et al.<sup>15)</sup> informed family members about the situation of the hospitalized patient using patient communication notes. Through this they collected family members' opinions, such as a wish to know the daytime condition, wish to know the reaction, and an ability to understand the situation without meeting the night-time staff, etc. The most common reason for visits among the intervention group in Study 2 was "Checking on the state of the inpatient", which accounted for 73.0% (137 cases) of the total. This finding supports reports by Kaneda et al. In other words, visits are believed to be the manifestation of family members' desire to know the state of the inpatients who are admitted, or an important event.

We found no previous studies on the importance of family visits in the field of welfare. However, there are a few studies in the medical care field. According to Takei<sup>16)</sup>, family visits are vital for understanding the patient and facilitating proper nursing care. According to Hiroi et al.<sup>17)</sup>, the number of family visits in psychiatric care is much lower; when a patient is admitted, the family relationship must be reconstructed as the patient is estranged and cannot be discharged from care. Both studies point to the importance of interaction between patients and family members to increase understanding of the patient and increase the likelihood of discharge. Furthermore, according to Kutsumi et al.<sup>18)</sup>, once a family entrusts a facility with the care of a patient, there is a psychological separation between the patient and their family. They often are unable to access home services provided under the Long-Term Care Insurance System because they do not understand how the system works. In other words, admission to the elderly brings alienation between inpatients and their family, making it difficult to return home. If alienation with family members does not occur, it will lead to them returning home, so it is necessary to increase the number of visits and try to maintain mutual involvement to prevent alienation between family members and inpatients. Therefore, based on the results of Study 1, we thought that it would be easier to return home by increasing the number of family visits to prevent alienation between family members and inpatients.

Although the number of visits after admission was significantly higher in the home group, visits to the home group decreased to the same level as the medical care group for the period prior to discharge. For inpatients to be discharged to home, it is essential that the bond between inpatients and their families are maintained and that the inpatients are not estranged.

Since it was found that the number of visits was important to being discharged to home, Study 2 was

conducted in order to increase the number of visits by the family members of the inpatients.

We expected a higher number of visits from inpatients having a larger number of family members; however, there was only a weak positive correlation ( $r = 0.283$ ,  $p = 0.008$ ). There were no differences in the number of visits between the intervention and control groups based on living status (living alone or with family) or the presence or absence of a partner.

In addition, there was a possibility that the number of visits could become a confounding variable that had already been researched. For this reason, a multiple regression analysis was conducted with the number of visits as the dependent variable, and age, number of family members, degree of care needs, degree of independence, and degree of cognitive impairment as independent variables. As a result of conducting a multiple regression analysis, it was found that although the number of family members could be considered to be a variable with an explanatory power significant at a 5% level, the degree of care needed, degree of independence, and degree of cognitive impairment did not have explanatory power. A comparison of the groups indicated that the number of family members was found to impact the number of visits.

Based on these findings, it can be said that the number of visits and the intervention are the variables that affect the number of visits. Although the difference was not statistically significant ( $p = 0.061$ ), the median number of family members of the intervention group was 5 people (range: 3-6), while it was 4 people for the control group (range: 3-5) (both figures are the median (interquartile range)). In other words, the number of visits in the intervention group may have been higher because the intervention group tended to have slightly more family members. However, as it is impossible to alter the number of family members, conducting interventions is seen as the only realistic avenue for increasing the number of visits.

Regarding increasing the number of visits through intervention to lead to the inpatients returning home, which was the objective of Study 2, no differences were found in the experimental and control group.

Long-term follow-up is normally necessary, and the duration of the study may have been inadequate to guide the results. The inability of inhabitants to return their homes is due to the need for medical care, as evidenced by Study 1, as well as their involvement with their families.

In this study, the requirements for inpatients to return to their homes include the absence of medical need and their families' desire for inpatients to return to their homes.

Since an increase in the number of family visits is expected to increase the amount of contact with the staff of the facilities, as well as the qualitative effects of preventing alienation from their family due to mere exposure effects, such factors need to be analysed in the future.

## **2.Mental and Physical Functional Aspects**

In Study 1, the admission period, degree of care needed, degree of independence, and degree of cognitive impairment were compared between the home group and medical group. As a result, a

difference was found between degree of care needed, degree of independence, and degree of cognitive impairment ( $p < 0.01$ ). This suggests that the home group had low degree of care needed and degree of cognitive impairment, with a high degree of independence compared to the medical group; in other words, the home group is believed to have a higher level of mental and physical functions.

Compared to the medical care group, the home group scored lower on degree of care and degree of cognitive impairment, and scored higher on degree of independence, thereby indicating higher mental and physical functioning. There have been multiple reports of studies on the burden of caregiving on family members<sup>19,20,21</sup>). A care recipient who has high mental and physical functioning might decrease the caregiving burden on their families, who must provide for them once they are discharged back home. However, while no correlation between degree of independence and care burden was found in past studies, a positive correlation between the degree of cognitive impairment and care burden has been reported<sup>22</sup>). Dementia may increase the frequency in which a caregiver has to keep watch over the care recipient, as well as leading to caregivers needing to be conscious of care in situations other than in just interacting with the care recipient. The fact that inpatients with a low degree of cognitive impairment (compared to the medical group) are being discharged to return home could indicate that the degree of cognitive impairment can impact where the inpatients are discharged to.

Kutsumi et al.<sup>18</sup>) compared two groups, discharged to home and discharged to other places, in terms of age, degree of care, degree of independence, degree of cognitive impairment, Barthel Index total scores, and length of stay. The results showed a higher degree of cognitive impairment in the discharged to other places group as well as a longer length of stay ( $p < 0.01$ ). The results of the present study also revealed a low degree of cognitive impairment in the home group, thereby supporting Kutsumi et al.'s results<sup>18</sup>).

This study also validated that patients can be expected to be discharged to home based on their activities of daily living level in the facilities. However, the people in the medical care group were discharged to medical institutions because of their need for significant medical care; to be discharged to home, it is most important to not have a high need for medical care.

### **Research Limitations**

Study 1, which examined the relationship between inpatients and their families, was limited to the number of visits during the two weeks after admission and the two weeks prior to discharge. We did not measure the number of visits in any other periods or intervals. To gain a better understanding, it is necessary to examine the frequency and trend of visits during the entire length of stay.

The Long-Term Care Insurance System was scheduled to be revised (April 2018) during the course of Study 2, which could have affected the findings; therefore, the first half of the five-month intervention period was concluded by March 2018. Long-term follow-up is normally necessary, and the duration of the study may have been inadequate to guide the results.

The frequency of visits in the intervention group was higher and the frequent interaction between the inpatients and their family members may have led to a shift in the consciousness of both parties, thereby maintaining or increasing their sense of affinity; however, since we did not investigate the feelings of alienation and intimacy, we could not mention the effects of simple contact or changes in consciousness.

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### **Conflict of Interest**

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