

## A comparative study of ADL at home and at care facilities: differences between systems of elderly daycare administration

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### Abstract

**[Purpose]** In elderly daycare facilities, services are provided according to independence support, which is the basic philosophy of Long-Term Care Insurance, to maintain and improve the user's activities of daily living (ADL). However, the efforts aimed at independence support and methods of service vary from facility to facility. In this study, we examined the relationship between the administrations system of the facilities and the user's independence of ADL, comparing two types of elderly daycare that provide different methods of service. Facilities that allowed the users to select the programs and time provided were classified into Group A, and those that provided predetermined sets of services were classified into Group B. **[Methods]** The subjects were elderly daycare facilities in three prefectures in the Hokuriku region of Japan; 46 users in two facilities in Group A, and 40 users in three facilities in Group B. Evaluation of ADL at home and at a facility was performed using the Functional Independence Measure (FIM).

**[Results]** There was no significant difference in the total FIM score at home between Groups A and B. In Group A, the total FIM score at the facility was significantly higher than that at home, while it was significantly lower in Group B. When the scores for each item in FIM at home and at the facility were compared, the scores for bladder control, bowel control, bed/chair/wheelchair transfer, bath/shower transfer, stairs, comprehension, and expression were significantly higher at the facility than those at home in Group A. In Group B, scores for grooming, dressing upper body, dressing lower body, bed/chair/wheelchair transfer, comprehension, and expression at the facility were significantly lower than those at home, while score for bath/shower transfer was significantly higher at the facility.

**[Conclusion]** When the users were allowed to select the contents of the program and when the program was offered at elderly daycare facilities, voluntary actions were promoted, which may have increased users' independence. The results indicated that when the program contents and the time provided were predetermined, assistance for the users might reduce the independence of the elderly.

### Key words

independence support, elderly daycare facility, administration system, ADL, FIM

### Introduction

The basic philosophy of the Long-Term Care Insurance Act is independence support. Therefore, the services and programs provided at elderly

daycare centers, such as daycare facilities and day service facilities, aim to maintain and improve the users' activities of daily living (ADL). Thus, users' independence of ADL should be the same or

higher at the facility than at home.

Several previous reports have discussed independence support at elderly daycare facilities. Ikeda introduced a system to allow the users to select the program contents to be performed to improve the users' independence<sup>1)</sup>. He found that the care level of more than half of all users showed improvement at the time of re-evaluation of the care level compared to when they first used the facility. This result was superior to the national data based on the 2007 Annual Report on Survey of Long-term Care Benefit Expenditures. In addition, Iwashita *et al.* reported that when critical paths, utilized at hospitals, were used in the nursing care field for 2 years, the care level of the users improved by an average of 0.15 degree of level<sup>2)</sup>. Group exercises and individual exercises conducted at elderly daycare facilities have also been shown to be effective in improvement of functions<sup>3,4)</sup>. On the other hand, care staff at elderly daycare facilities often experience problems with users who prefer to receive assistance service rather than to have support for their independence<sup>5)</sup>. This makes independence support difficult.

Efforts for independence support and contents of programs differ between elderly daycare facilities, and their effects on maintenance and improvement of users' ADL are unclear. In this study, we examined the relationship between the differences in systems of elderly daycare administration and independence in ADL of the users from the viewpoint of independence support. Our previous study showed that one of the factors inhibiting independence support at elderly daycare facilities is the limited time available to provide services and programs<sup>6)</sup>. Thus, the administration systems included in this study were classified into two types based on time utilization method in the facility.

### Methods

Five facilities located in 3 prefectures in the Hokuriku region of Japan approved participation in this study, while two facilities refused. We divided the five participating facilities in two groups. The first consisted of elderly daycare

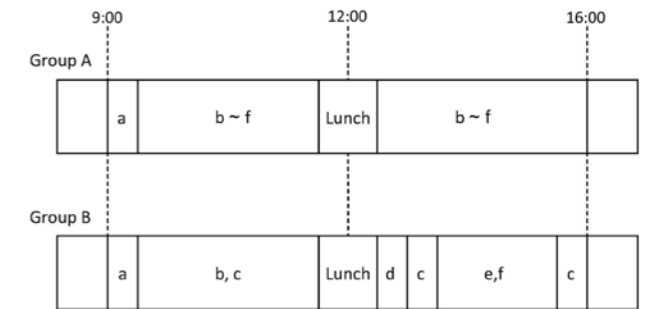


Figure 1. The typical time schedule at each facility  
a: Medical check, b: Bathing (Grooming, Dressing), c: Toileting, d: Relaxation, e: Rehabilitation (machine exercises, sling exercise therapy, mat exercises, stair stepping etc), f: Recreation (balloon volleyball, quoits, craft etc), b~f: In the Group A represents that the user can select voluntary any of the programs or activities from b to f.

facilities (Group A) with administration systems in which the users voluntarily select the daily program contents and timing of when programs are provided, such as services for basic care, including meals and baths, as well as rehabilitation and recreational activities. The other consisted of elderly daycare facilities (Group B) in which the contents of the program and timing of when the programs are offered at the facility are predetermined. Figure 1 shows the typical time schedule at each facility. In group A, the users are allowed to decide on the contents of the programs to be performed for the day and the time at which they are performed. In group B, the users are taken to the toilet at a predetermined time, while in Group A toileting assistance is provided at the pace of the users as required. In Group B, staff took users to the location where the service was to be provided, while in Group A users had to make their own way to where the service is provided. Functional exercises performed for Group A included exercises to strengthen the lower limbs using body weight as well as exercises using machines, active-assisted mat exercises, and sling exercise therapy, and the exercises were selected by the users. On the other hand, in Group B, the functional exercises performed included exercises selected by the staff, such as standing-up and walking exercises. Moreover, stair stepping exercise was provided as part of rehabilitation at the two

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facilities in Group A. This exercise was actively performed with the assistance of the staff. The users of elderly daycare facilities in each group were examined to determine differences in independence of ADL at home and at the facility. The participants were recruited by the information documents on this study at each facility. Users with serious medical problems were excluded from this study. Consequently, the study population consisted of 46 users in 2 elderly daycare facilities classified into Group A and 40 users in 3 elderly daycare facilities classified into Group B. The participants or their families and facility administrators were informed of the procedure and written consent was obtained. The study was approved by the Medical Ethics Committee of Kanazawa University (Acceptance no.183). Functional Independence Measure (FIM), 3<sup>rd</sup> edition, Japanese version was used for ADL at the facilities and at home. ADL at the facilities was determined by staff responsible for providing care to the users. ADL at the facilities was determined by family members through interviews or by telephone. When the user lived alone, ADL was determined by telephone interview with the helper providing

home care services. The intraclass correlation between the FIM ratings assigned by the telephone interview and by the trained nurses was 0.97<sup>7)</sup>. The results indicated good intermodal agreement for follow-up telephone assessment using the FIM. Some other studies in this field also supported the conclusion<sup>8-11)</sup>. We collected characteristic samples from chart review. The duration of the study was from 23 May to 31 December 2009. For statistical analysis, the Mann-Whitney U test was used to compare total FIM score and FIM scores for each item for at home between Group A and Group B. Wilcoxon's signed-ranks test was used to compare total FIM score and FIM scores for each item for home and at the facility in each group. Statistical analyses were performed using PASW Statistics 18 software. In all analyses,  $P < 0.05$  was taken to indicate statistical significance.

## Results

Table 1 shows the profiles of the subjects. Group B included more women than Group A. The age in Group B was higher than that in Group A. With regard to care level classification, as there were few subjects classified as needing support 1

Table 1. Subject characteristics

Characteristics	Group A (n=46)	Group B (n=40)	P
Age,y (mean ± SD)	75.2 ± 12.2	82.7 ± 10.8	$t = 1.99$ <0.01
Sex			$\chi^2 = 6.61$ <0.01
	male	10	
	female	30	
Care Level			$\chi^2 = 2.94$ NS
	need support 1 and 2	6	
	level 1	6	
	level 2	12	
	level 3	10	
	level 4 and 5	6	
Main disease			$\chi^2 = 6.41$ <0.05
	cerebrovascular disease	19	
	orthopedic disease	11	
	internal medicine disease, and other	10	
Participating per week			$\chi^2 = 3.01$ NS
	1 time/w	7	
	2 times/w	12	
	3 times/w	11	
	4 and 5 times/w	10	

Age:  $t$ -test, others:  $\chi^2$ -test  
NS: not significant

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and 2 in Group A and care levels 4 and 5 in Groups A and B, those needing support 1 and 2 in Group A were combined, and those requiring care levels 4 and 5 were combined in both Groups A and B. There was no difference in care level between Groups A and B. Group A included more subjects with cerebrovascular disease than Group B, while Group B included more subjects with orthopedic disease, internal medicine disease, and other than Group A. Few subjects in Group A used the facilities 4 or 5 times a week, and few subjects in

Group B used the facilities 5 times a week; therefore, 4 and 5 times a week were combined together to form a single category. There was no significant difference in frequency of facility use between Groups A and B.

There were no significant differences in total FIM scores at home between Groups A and B (Figure 2). In Group A, the total FIM score at the facility was significantly higher than that at home, while it was significantly lower in Group B. Each FIM item was compared between Groups A and B,

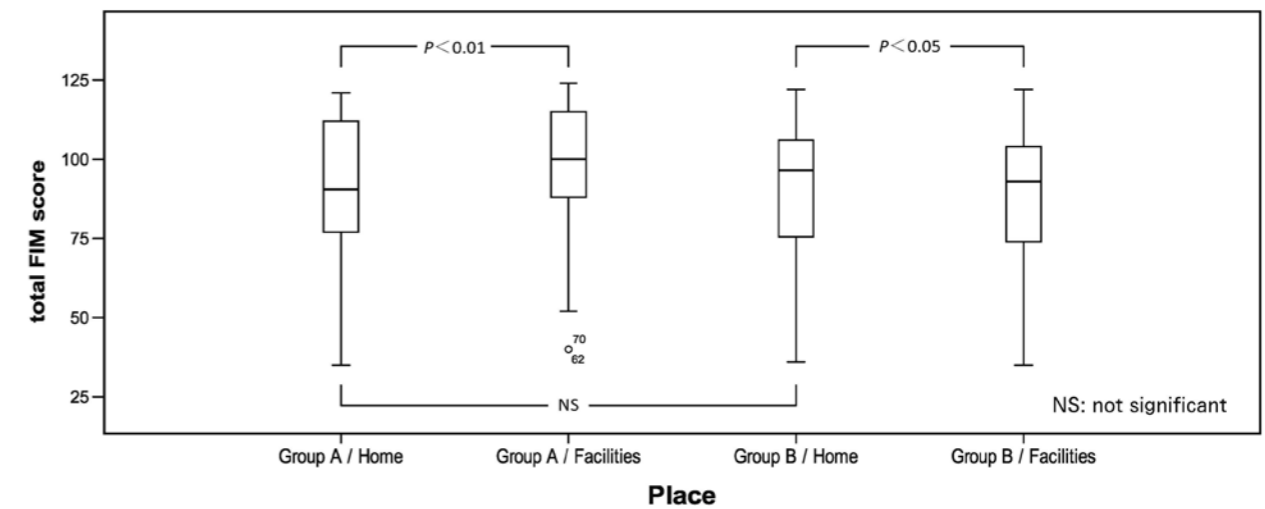


Figure 2. Box-chart of total FIM score

Table 2. Scores of FIM items

	Group A			Group B		
	Home	Facilities	P	Home	Facilities	P
Eating	7(7~7)	7(7~7)	NS	7(7~7)	7(7~7)	NS
Grooming	7(4~7)	7(5~7)	NS	7(5~7)	4.5(2~7)	<0.01
Bathing	1(1~7)	4(2~7)	NS	1(1~5)	2(1~5)	NS
Dressing upper body	5(5~7)	5(4~7)	NS	5(4~7)	5(2~5)	<0.01
Dressing lower body	5(4.75~7)	5(4~7)	NS	5(4~7)	4(2~5)	<0.01
Toileting	7(5~7)	7(5~7)	NS	7(4.25~7)	7(5~7)	NS
Controlling bladder	7(5~7)	7(7~7)	<0.05	7(5~7)	7(5~7)	NS
Controlling bowel	7(6~7)	7(7~7)	<0.01	7(6.25~7)	7(7~7)	NS
Transfer bed/chair/wheelchair	6(5.75~7)	6.5(6~7)	<0.05	6(5~6)	5(4~6.75)	<0.05
Transfer toilet	6(6~7)	6(5~7)	NS	6(6~7)	6.5(5~7)	NS
Transfer bath/shower	4(1~6)	4.5(3~6)	<0.01 *	1(1~4)	4(1~5)	<0.01
Walk/Wheelchair	6(4~7)	6(5~7)	NS	5.5(4~6)	5(4~6)	NS
Stairs	1(1~1)	1(1~5)	<0.01	1(1~3)	1(1~3.75)	NS
Comprehension	6.5(5~7)	7(6~7)	<0.01	7(5~7)	6(3~7)	<0.01
Expression	7(6~7)	7(6~7)	<0.05	7(4.25~7)	6.5(3~7)	<0.05
Social interaction	7(7~7)	7(7~7)	NS *	7(4~7)	6.5(4~7)	NS
Problem solving	4(2~5)	4(2~6.25)	NS	5(3~5)	5(3~7)	NS
Memory	4(3~5)	4(3~5)	NS	4.5(3~7)	4.5(2.25~7)	NS

Values are median (25th percentile; 75th percentile) NS: not significant \* :  $P < 0.05$ , between Group A and B at home.

and the results indicated that the scores of bath/shower transfer and social interaction for Group B were significantly lower than those for Group A, while there were no significant differences in the other items (Table 2). Comparison of scores of each FIM item in each group indicated that the scores for bladder control, bowel control, bed/chair/wheelchair transfer, bath/shower transfer, stairs, comprehension, and expression in Group A were significantly higher at the facility than at home. In Group B, scores for grooming, dressing the upper body, dressing the lower body, bed/chair/wheelchair transfer, comprehension, and expression were significantly lower at the facility than at home, and the score for bath/shower transfer was significantly higher at the facility than at home.

### Discussion

The levels of independence in bladder control and bowel control were higher at the facility than at home in Group A, but there were no differences in independence between home and facility in Group B. A previous report discussed the effectiveness of functional exercises planned and conducted to stabilize mobility activities, in efforts to increase independence in toileting<sup>12)</sup>. This report also indicated that functional exercises can expand the users' ADL, and cognition such as resolution and memory function are also improved. In the present study, functional exercises were performed in both groups. These observations suggest that functional exercises are not a direct factor in improving independence in toileting or cognition, but that other factors are also involved.

In a previous study<sup>12)</sup>, the staff conducted functional exercises and encouraged the users to go out shopping to change their mood and to increase their opportunities to interact with others. The study indicated that this promoted voluntary actions of the patients and improved resolution and memory. Thus, the scores for comprehension and expression at the facilities in Group A were also significantly higher than those at home.

Moreover, Sugihara *et al.*<sup>13)</sup> investigated the relationship between independence of toileting

activities, including transfers within elderly daycare, and standing-up capability, and reported a significant decrease in standing-up capability in the group with difficulty in independence in toileting compared to the group with independence in toileting. In addition, Wang *et al.*<sup>14)</sup> showed that even in users without incontinence at present, if the balance function is not good, there is a possibility that ADL capability may decrease in future. The item related to balance function in this study was bed/chair/wheelchair transfer. The increase in number of voluntary transfers in Group A improved their balance function, which in turn improved the independence in bladder control and bowel control at the facility. In Group B, the scores for independence of bladder control and bowel control were the same at the facility and at home, but the independence of bed/chair/wheelchair transfer at the facility was lower than that at home; this was the opposite of the observations in Group A. These observations also indicated that the facility administration system in Group B may inhibit the long-term independence of ADL in the users.

The score for stairs in Group A was higher at the facility compared to that at home. Often the users' living space at home is located on the first floor for safety and to reduce the burden of care, and thus the users hardly have a chance to use stairs. Suzukawa *et al.*<sup>15)</sup> reported that the independence of stairs and whether the users go out or not are related, and that elderly subjects who do not go outside have decreased physical function and cognitive function compared to those who do go out. These results suggest that offering stair stepping exercise as part of the program may maintain or improve the users' physical and cognitive function.

In Group B, the scores for grooming, dressing the upper body, and dressing the lower body were lower at the facility compared to those at home. Shibasaki<sup>16)</sup> reported that in elderly daycare facilities with the same administration system as those in Group B spend more time in assistance in personal care, such as grooming and bathing, compared to the time spent on other programs.

This suggests that in Group B, the time spent on assistance with grooming, dressing the upper body, and dressing the lower body may have been limited, and thus the service for assistance had to be prioritized over service for independence support. This may have been responsible for the decrease in independence at the facility.

The score for bath/shower transfer at home was higher in Group A compared to Group B. However, the score for bath/shower transfer at the facility was higher than that at home in both Groups A and B. That is, independence support for bath/shower transfer is being provided in both groups despite the differences in administration system. This result corresponds to the report of Hoshika<sup>17)</sup> indicating that independence of transfer in the bathroom or into the bathtub is higher at facilities than at home despite the differences in degree of care level. Tsutsui *et al.*<sup>18)</sup> and Hirose<sup>19)</sup> reported that bathing is a factor that increases subjective perception of caregiver burden. In addition, Ohtsu *et al.*<sup>20)</sup> and Watanabe *et al.*<sup>21)</sup> reported that among the different services provided at elderly daycare facilities, bathing is the service the patients look forward to the most. Bathing is considered as a service provided at the elderly daycare facilities regardless of the independence of the users.

Score for social interaction at home was higher for Group A than Group B. Although the reason is unclear, this was likely because the users in Group B were older than those in Group A, and also because many in Group B were diagnosed with dementia classified as other disease in this study. There were no differences in scores for social interaction between at home and at the facility in each group, suggesting that the difference at home had no effect on the comparison between the facilities in this study.

Finally, in Group B, the services were provided to all users at the same time. This often causes the users to be more passive. Specifically, independence in transfers and grooming were decreased at the facility compared to those at home. When these activities take time if performed by the users, the care staff can save time by assisting them. Our

previous study<sup>6)</sup> indicated that the care staff understood that the users felt the role of the care staff was to provide services for assistance rather than to provide independence support. We also found that this is a factor that makes independence support difficult. Takahashi *et al.*<sup>22)</sup> conducted a questionnaire survey among care staff regarding images associated with the terms of care work. The majority of the care staff associated terms with services for assistance, and also noted that this prevents independence support. By changing the system so that the users can select the program, the time limitations of the care staff may be reduced, which may allow them to change from services for assistance to services for independence. This may improve the factors preventing the care staff from providing independence support.

Ogawa *et al.*<sup>23)</sup> examined the factors that affect the continuous usage of elderly daycare facilities by elderly subjects who require care. The results indicated a relationship between continuous usage of elderly daycare facilities and the types and numbers of recreational programs offered at those facilities, and thus confirmed the necessity of examining individual programs by considering the characteristics of the users. Fujiwara *et al.*<sup>24)</sup> reported that services provided according to the user's independence are necessary rather than providing the same service to everyone, as the purpose of using elderly daycare facilities differs based on ADL capabilities of the users. These observations also suggest that providing services and programs that can be voluntarily selected by the users is more desirable.

In conclusion, this study indicated that elderly daycare administration in which the users can select the contents and timing of programs promoted the independence of the users' ADL compared to elderly daycare administration in which the contents and the timing of the programs are predetermined.

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