

Residents' Occupancy of Lounges and Hallways in Korean Skilled Nursing Facilities for the Elderly

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Abstract : The purpose of this study was to provide basic information regarding the planning of lounge and hallway areas for skilled nursing facilities for the elderly, given that residents spend much of their time in these areas. This study examined Korean elderly residents' occupancy and behavior in lounges and hallways in order to analyze how plan type, spatial composition, and equipment affect residents. To do this, observations were conducted in five facilities that were provided to the elderly at no charge. Results indicate that a central garden offers a wide hallway area that can be used not only for strolling but also for list of activities; at the same time, it can reduce the overall rate of inactivity. A shorter distance between the lounge and hallway on the opposite side is likely to help better disperse residents' throughout the facility. Hallway corners have potential for activities that may require sofas, tables, or equipment for individual activities; they could also be used for planned interaction programs or unplanned collaboration on the part of small groups of residents.

Key Words : Elderly housing, Spatial using behavior, Lounge, Hallway, Nursing home

I. Introduction

In Korean skilled nursing facilities for the elderly, a lounge is a space into which a hallway extends; it is used for recreation and resting, and may also be called a dayroom, lobby, or alcove, depending on how big it is and how many there are within the building. Elderly residents spend most of their time in the lounge when they are not in their respective rooms. The hallway, on the other hand, is an area of both common and residential use, and activities here include the movement of residents, food, and goods, indoor walking or wandering, resting, and interaction among residents (Son, 1999; Lee, 2003; Lee and Ryou, 2004).

Of the various facilities for elderly welfare in Korea, skilled nursing facilities for the elderly have been increasing rapidly. They have an important role in

preventing isolation and improving the rehabilitation of elderly patients with severe diseases through a positive housing environment, social participation, and communication activities (Son, 1999). Lounges and hallway areas of facilities are used for diverse activities which include medical treatments, leisure programs, recreation, walking and resting, eating meals, and sleeping (Yang, 2002; Lee, 2003; Lee & Ryou, 2004). Since these activities have such an important impact on informal elderly support, architectural solutions are needed with regard to spatial layout and facility design elements in order to improve elderly social recovery. However, research on nursing facilities for the elderly has not taken these elements into consideration. It has focused instead on increasing occupants, the analysis of plan types, location, required areas, and on barrier-free equipment. Research into detailed plans with respect to the spatial composition for providing

effective rehabilitation of elderly residents is required and of no major concern.

The study was based on the detailed composition of lounges and hallways and their influence on elderly residents' emotional states and rehabilitation. Some previous studies examined residents' behavior during time spent in lounges and hallways (Kim, 1998; Song, 1998; Son, 1999; Ryou, 2001; Lee & Ryou, 2004); the results showed a number of different activities that took place in these areas. It indicated that certain motivational elements were required with respect to spatial composition in order to prevent residents from engaging in inactivity that constituted more than half the total behavior in lounges and hallways (Lee & Ryou, 2004). Therefore, this study aimed to clarify how compositional and detail elements of lounges and hallways affect the behavior of residents. The goal was to examine Korean elderly residents' occupancy and behavior in lounges and hallways in skilled nursing facilities in order to analyze how plan type, spatial composition, and equipment affect residents. Ultimately, the aim was to provide basic information that would be beneficial to the planning of public areas such as lounges and hallways, and to facilitate the development of more effective nursing environments for the elderly.

II. Literature Review

1. Skilled nursing facilities for the elderly in Korea

<Table 1> shows the changes in Korean skilled nursing facilities for the elderly over the past five years. Skilled nursing facilities are for elderly with severe geriatric diseases such as dementia or paralysis; they provide daily conveniences such as meals and bathing. It is subdivided into free, actual expense, and paid. Free skilled nursing facilities are intended to help those aged 65 and over who are covered by the welfare protection law, or whose family members are unable to pay for

<Table 1> The Changes in Korean Skilled Nursing Facilities for Elderly over the Past 5 Years

Skilled Nursing Facilities	2001	2002	2003	2004	2005
Free	32	42	53	77	122
Actual Expense	-	-	-	-	3
Paid	3	4	6	15	33

Source: <http://www.elder.or.kr>

appropriate medical welfare services. In Korea, the numbers of paid nursing and skilled nursing facilities are rapidly increasing. Between 2001 and 2005, the number of free skilled nursing facilities showed a four fold increase, while paid facilities increased by more than ten times; this trend is continuing with the support of the current administrative policy. Government investments are currently concentrated on skilled nursing facilities for the elderly with severe diseases currently and paid facilities still depend on big business to provide expensive services and facilities. Elderly welfare facilities in Korea are expanding to focus on facilities for the low-income elderly group that are not under the social welfare protection law and whose minimal living requirements cannot be supported by the government or their family members.

Several architectural regulations about skilled nursing facilities fall under Section 22 of the elderly welfare law enforcement regulations. These regulations only articulate a minimum of square meters for individual rooms and the spatial composition of specific facilities. There are no guidelines regarding lounges and hallways in which the elderly spend most of their time. However, there are regulations in regards to the arrangements of amusement halls for performing programs and recreational activities and sunrooms for 50 elderly people or more.

2. Review of previous studies

Pinet (1995) found that nursing home residents visited the common lounge area for the following reasons: the lounge had specific services such as

activities or meal services; they freely chose to go there for the pleasant atmosphere or were escorted by a staff member. In addition, corridors were understood as non-designated social areas, and residents commonly gathered informally in corridors and in the areas around nurses' stations.

Song (2002) focused on the importance of spatial continuity between public and private spaces in nursing homes. He stressed that spaces should provide the elderly with choices between public and private and that a nursing home's physical environment should support a variety of behaviors, from active to passive participation, in regards to the facilities programming. Son (1999) highlighted the importance of semi-public and semi-private areas. She noted that nursing home residents generally engaged in social interaction through informal contacts rather than through official programs and that these interactions mainly occurred in semi-public and semi-private areas such as public corridor alcoves, which, incidentally, created a sense of individual domain. Pinet (1995) recommended that spaces be made available for simple observation behavior because elderly residents may be more likely to participate in an activity once they have had the opportunity to observe it from a distance.

A number of researchers have also commented on lounge planning. Song (2002) observed that a row of chairs arranged against a wall in the lounge discouraged elderly residents from engaging in activities in that area. In this situation, nursing home residents tended to interact in the corridors near their individual rooms, even though these areas were inappropriate as social spaces. Leibrock (2000) suggested that large spaces may feel unfamiliar and may confuse the elderly. She proposed that nursing home facilities provide a variety of spaces and that large spaces should be subdivided into areas for social interaction, hobbies, and everyday life activities, as well as for supportive services. Unit clusters have frequently been emphasized as a way of encouraging social exchange in nursing facilities. Cohen & Weisman (2001), for example, suggested that large common spaces, such as a shared lounge, be

subdivided for specific activities; they also proposed clusters of eight to ten dwelling units to stimulate the creation of group characteristics. Additionally, Regnier (2004) noted that the clustering of units could reduce the perceived length of a corridor, and create opportunities for social interaction. Regnier also suggested possible unifying components for the unit clusters, such as a window, Dutch doors, a display shelf, alcove, furniture, or a light fixture. Lee (2003) suggested that it is important for nursing homes to have several lounges, to create a sense that various spaces and activities are available, in contrast to one large lounge where all activities take place. Kim (1998) acknowledged that in a small facility, a central, multi-purpose lounge may work best.

A number of researchers have also commented on corridor design and type. For example, many have recommended limited use of central corridors and increased use of garden-type corridors (Kim, 1998; Ryou, 2001; Yang, 2002; Lee, 2003). Brawley (1997) indicated that long corridors could upset the elderly residents' sense of physical and emotional safety, and could lead them to become confused or lost. Almborg & Paulsson (1991) noted that corridors with numerous doors should be avoided, as these sorts of spaces can disorient residents with dementia; they also recommended that connections between individual and common spaces be simple and close.

To summarize, previous researchers have suggested that several small lounges are better for encouraging various group activities than one large lounge. In conjunction with this design, lounges should have clear functions and include not only space for activities but also observation spaces where residents can simply watch. A small alcove is a good example of a "private" space in a public area. Furthermore, corridors should be short and simple so as not to confuse residents. A central garden corridor can expect frequent use.

Skilled nursing facilities for the elderly in Korea generally suffer from small plots and buildings, as well as staff and budget shortfalls. These problems make satisfying the above conditions, such as several lounges

or various spaces, difficult. This study examined ways to efficiently use lounge and corridor spaces within the current settings of Korean nursing homes.

III. Research Process

1. Research method

Five research facilities were selected for this study. They were all located in the south province of Korea, and were free for the elderly that were covered under the social protection law; all facilities permitted observation. Paid facilities were excluded from this study because of their limited numbers in Korea and also because this study focused on how to solve problems involving spatial composition in free facilities which are typically founded with limited budgets.

Initial field investigations were conducted from 13 - 24 December 2003, to determine the basics of each research facility: architectural guidelines, the floor plan, and characteristics of residents, including degree of walk ability, age, and gender. Staff in each facility recommended several days for observation that were free of special ceremonies or events like buffets, birthday parties, or other local events; full observation was performed throughout one day between 12 January and 9 February 2004 in each facility. Observation began at 10:00 a.m., when cleaning and staff meetings were completely. Observations ended at 4:30 p.m., when staff began to prepare for dinner. When a facility had multiple floors, the most populated floor was observed. There were five observers, including the researcher; each observed a section of a lounge and hallway, marked the resident occupancy on the floor plan at 30-minute intervals, and noted the residents' behaviors.

The research and analysis of the study contained the following parts:

First, basic spatial layouts of lounges and hallways were analyzed; this included examination of interior

elements such as furniture, equipment, and the various accessories used to arrange spatial composition elements in such a way as to influence the residents' occupancy and space-using behavior.

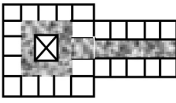
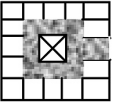
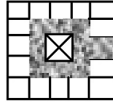
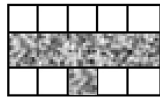
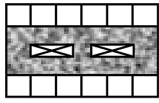
Second, residents' occupancy and space-using behavior in lounges and hallways were analyzed by looking at their daily routines and how these routines were influenced by spatial composition elements.

2. General characteristics of facilities studied

<Table 2> shows architectural guidelines for the facilities studied. Five facilities, founded within the past four years, were located in rural or suburban areas, and consisted of one small building with two or three floors. Most facilities studied were established on the basis of social welfare, but Facility E was administered by the city and had additional facilities onsite, such as a local welfare center and welfare housing for the elderly. Facility lounges were extensions of hallways. In Facilities A-D, the lounges were large, ranging from 64.8 - 88.8 m², as compared to a smaller lounge in Facility E, which was 16.4 m². The hallway in Facility E was a double hallway type and was the largest at 330 m². Facility D which was a center hallway type had the smallest at 120 m². The width of facility hallways ranged from 2.4 m to 3.0 m; this meets the minimum standard width of 1.8 m given by Song (1998). Facilities had various types of plans: Facility B and C had a central-garden, in which the hallway surrounded a garden in the center of the floor; Facility D was a center-hallway type, in which residents' rooms faced each other with a hallway in the center. Facility E, on the other hand, had a double hallway with two sunken gardens, and Facility A was a mixed-type consisting of a central garden and a center hallway. Most previous studies have indicated that a group-home type with several lounges improves informal support for the elderly but, owing to limited budgets, free facilities in Korea generally have not provided this type of facility. These cost free facilities generally have one large lounge with center hallways or central gardens which

<Table 2> Architectural Guidelines of the Facilities Studied

(area: m²)

Facilities	A	B	C	D	E
Year founded	2002	2001	2003	2002	2001
Location	Suburb	Rural	Suburb	Rural	Suburb
Lot Area	5,555	9,720	3,841	3,140	-
Building area (Total Floor Area)	1,005.9 (1,908.3)	1,636.2 (2,041.2)	735 (1,983.1)	871.4 (1,705.9)	- (1,824.1)
Total Floor	3	2	3	2	2
Residence Floor	2*	1*	2*, 3	2*	1, 2*
Lounge Area	89	72	65	78	16.4
Hallway Area (Hallway Width)	231 (2.7m)	230 (3m)	198 (3m)	120 (2.4m)	220 (2.7m)
Plan Type	 Mixed Type (Central Garden + Center hallway)	 Central Garden	 Central Garden	 Center hallway	 Double hallway

* Floor of observation

<Table 3> Characteristics of Elderly Residents in Facilities Studied (Based on the Data of Dec. of 2003)

Facility	Capacity (Current Residents)	Gender		Age						Degree of Walk Ability			# of Residents at Observation Floor*
		M	F	-64	65-69	70-74	75-79	80-84	85-89	90+	Impossible	Aid Needs	
A	50 (49)	8	41	4	13	24	8	26(53%)	12(24%)	11(22%)	49		
B	70 (70)	19	51	11	34	25	26(37%)	22(31%)	22(31%)	70			
C	50 (48)	6	42	4	17	20	7	16(33%)	25(52%)	7(15%)	40		
D	55 (53)	9	44	4	33	8	9	8	22(42%)	8(15%)	23(43%)	53	
E	72 (76)	8	68	10	22	44	25(33%)	51(67%)	40				

* #: Number

require a lower budget and fewer staff. They are also more convenient for the administration and can accommodate more elderly residents than in a group home design.

<Table 3> shows the characteristics of elderly residents living in the facilities studied. Facility capacity ranged from 50 to 72 and most of them were filled to capacity except for one or two spaces. There were 76 residents living in Facility E, four over than capacity; this was due to residents needing short-term

care. There were far more elderly females than males, and the majority of residents were over 75 years old. The ability of the residents to walk was examined because it has a major influence on activity in lounges and hallways. In the facilities studied, 33 - 47% of residents were unable to walk; 53 - 70% were able to walk independently, with assistance, or with a walk-aid. These percentages indicate that in the facilities studied, more than half of the elderly residents had no problems using lounges and hallways.

IV. Results and Discussion

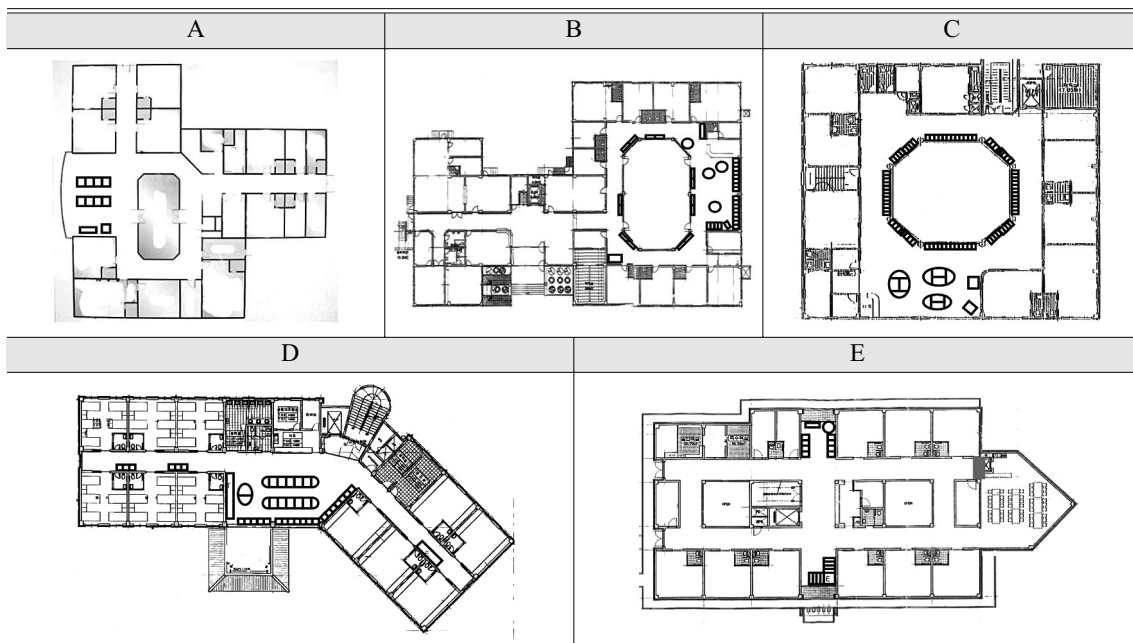
1. Basic spatial layouts

Most facilities separated areas used by staff and residents. In Facilities A, C, and D, residential areas were separated from administration areas by floor; the first floors were used mainly for office work, and the second floors were used for residences, lounges, bathrooms, and other living spaces. On the other hand, Facility B had both office areas and residences on the first floor, but the functions of these two areas did not overlap as they were visually divided by being situated either to the left or right of the residence entrance door, which was located in the center of the floor. In Facility E, the second floor was composed of residences, bathrooms, and a dining room; on the first floor, an office work area co-existed with other residences, without any separation devices. This area of mixed function did not cause any major problems because the majority of elderly residents had minor ailments and were relatively coherent. Most of the facilities apportioned residence rooms according to seriousness

of disease or gender; this made it convenient for staff to manage the facility.

In each facility studied, the layouts of lounges and hallways were examined (table 4). In Facilities A-C, lounges were located opposite the entrance, compared to those in Facilities D and E where the lounges were very close to the entrance so that the spaces were relatively open and also used as a lobby hall. Most of them had a window wall to improve lighting, widely matted floors and several low tables so that residents could share meals and other social activities on the floor. Some (Facility A, B, and D) placed sofas in a row along sidewalls or window walls so that residents could choose between a Western or Korean style of sitting. Even though it was winter, residents did not encounter problems spending time away from their own rooms since most facilities provided floor heating in lounges and hallways. The seating areas in hallways where sofas were placed along sidewalls (Facility B, C, D) played roles of semi-public and semi-private areas that Son (1999) mentioned in her study, and encouraged residents to come out of their rooms, to sit and rest, or to make conversation with other residents

<Table 4> Basic Spatial Layouts of Facilities Studied



and staff. Facility B had several circular tables scattered around, and residents who used wheelchairs and were unable to sit on the sofas could interact with other residents around the tables.

The facilities had other equipment in the lounges including televisions and karaoke machines. Some also had pianos, exhibited crafts and paintings that the residents had made during art programs, or hung mobiles to invoke emotional responses. These items were mainly used during birthday parties or at other events.

2. Residents' occupancy and use

1) Total occupancy and use of lounges and hallways

At 30-minute intervals, residents' occupancy of lounges and hallways was marked on a floor plan; all results are shown in <Table 5>.

On the whole, differences in occupancy were caused by the existence of central gardens and sofas surrounding it. Facilities B and C, which were central garden types and had sofas along its walls, showed similar resident occupancy. The elderly were widely dispersed on the floor of the lounge and the sofas of the hallway along the wall of the central garden. Residents in Facility B were in the hallway more often, as there was a relatively short distance between the lounge and the opposite side of the hallway, so that residents in any area of the hallway were able to watch what was happening in the lounge.

On the other hand, in Facility A, which also had a central garden but no sofas along its walls, residents spent most of their time in the lounge for participation in programs, taking meals, and watching television. They seldom took seats in other hallways or around the central garden. In Facility D which did not have a central garden, the lounge was very crowded, even though the lounge was of relatively large size at 78 m². In Facility E, residents seldom used the lounge or hallway since there were no sofas in the hallway, and the lounge was small; however, as compared to other

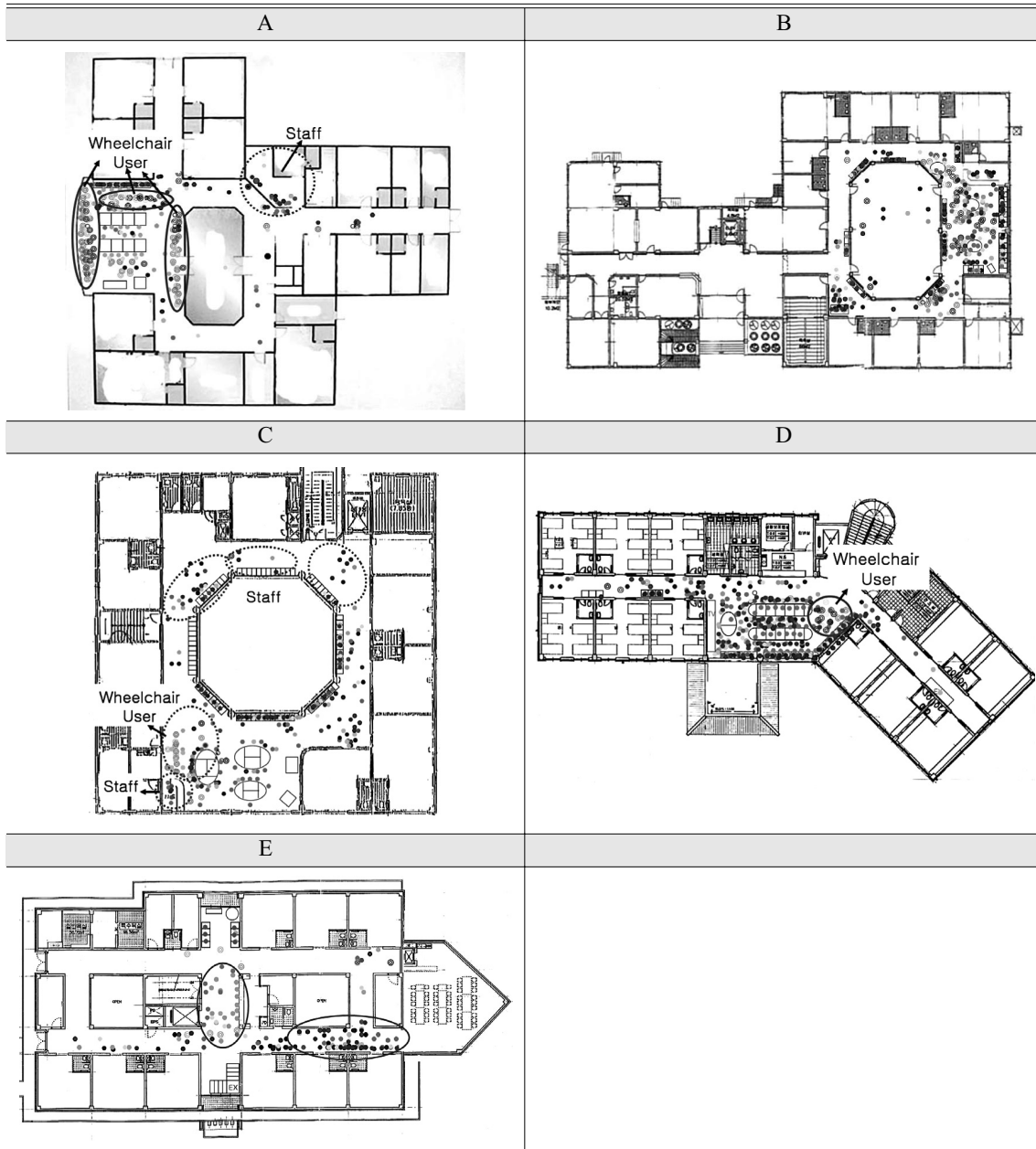
facilities, the administration in this facility did not require residents to leave their rooms. Residents with wheelchairs in Facilities A, C, and D had certain spaces that were occupied, compared to Facilities B and E where there was no difference in occupancy between residents with wheelchairs and those without. Residents sat along the wall of the central garden and next to the window wall, the floor at the rear of the lounge, or the extra space on the floor between tables.

2) Residents' occupancy and use throughout their daily routine

<Table 6> shows residents' occupancy of lounges and hallways throughout their daily routine including 'ordinary', 'meal', and 'program'. These were determined by a specific time; for example, occupancy during ordinary time was based on occupancy at 10:30, mealtime was at noon, and program times varied based on scheduled program times in each facility.

During ordinary time, in most facilities, residents were more likely to occupy sofas along the wall in the lounge and mainly slept, watched television, wandered or were inactive. It was in accord with Song (2002)'s study in which a row of chairs against a wall in the lounges decreased activities of the elderly. Physical motivation is required in lounges and hallways in order to reduce inactivity and to encourage individual or small group activities that can be performed naturally, as part of a daily routine. In Facility B, motivational elements in the lounge and hallway, such as seats and tables in the corner and throughout the hallway, encouraged residents to gather and converse with others during ordinary times and this arrangement distributed the residents' occupancy over a relatively wide area. This may have been because the sofas in the corner helped residents feel that their privacy was secure, but that they could still get together with several others for small group activities, as Son (1999) who stressed the importance of public corridor alcoves. Due to the high occupancy of the corner seating area, interactive programs for residents should be considered for this location.

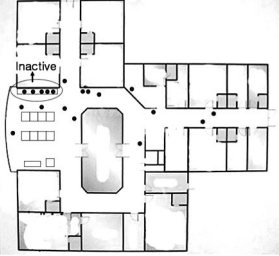
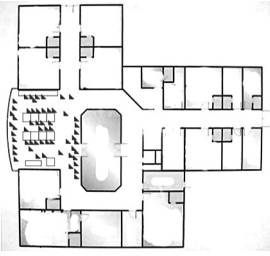
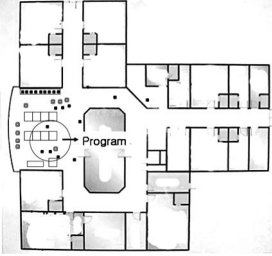
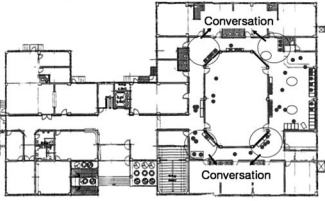
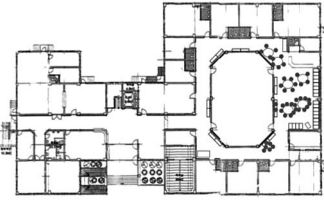
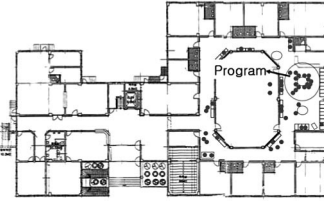
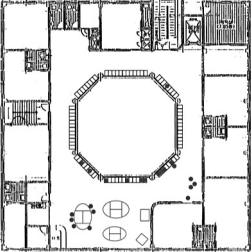
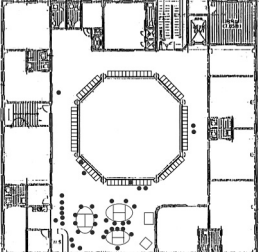
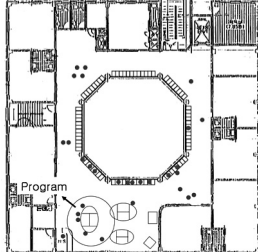
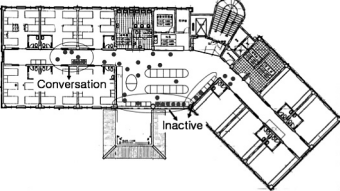
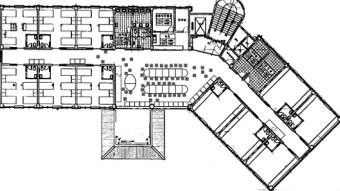
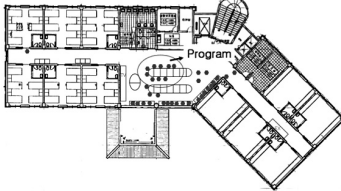
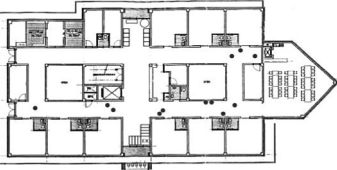
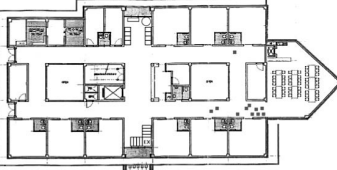
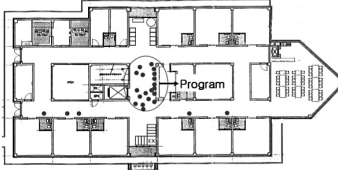
<Table 5> Total Occupancy and Behaviors in the Lounge and the Hallway



During program times and meals, Facilities A - D tended to manage residents in the lounge for convenience, but since Facility E had a small lounge, programs were performed in unoccupied spaces in front of the elevator, and meals were served in a dining hall on each floor. During meals, seats were mainly arranged by staff, and residents did not try to move

these arranged seats, with the exception of physically independent residents who were able to move independently. In Facility D, the lounge was very crowded during meal times, as most of the residents came out of their rooms and got together during these times. In Facility E, where most residents used the dining hall on the right side of the building, residents

<Table 6> Residents' Occupancy Throughout Their Daily Routine

	Ordinary	Meal	Program
A			
B			
C			
D			
E			

who were unable to get a seat inside were arranged on the floor of the hallway at the entrance of the dining hall and were served meals on low folding tables.

During program time, in Facilities A-D, residents participated in their programs using one or two tables on the floor of the lounge. Participants, staff, and the instructor sat together at the table; residents who did

not participate or who were in wheelchairs watched the program from other areas of the lounge, while the other residents got together in the hallway and interacted or rested. In Facility E, according to staff, programs in Facility E were typically performed in the space between the elevator and the nurse's station or in the dining hall. On the day of observation, the program

was Yoga; it was conducted in front of the nurse's station. Residents and staff sat on the floor and did exercises, as guided by the instructor; it took 20 - 30 minutes, which was similar to programs at other facilities.

V. Summary and Conclusion

The purpose of this study was to provide basic information regarding the planning of lounge and hallway areas for skilled nursing facilities for the elderly, given that residents spend much of their time in these areas. The results are summarized as follows.

First, in investigation of basic spatial layouts, lounges need to be located opposite the main entrance for residents' privacy and to promote a comfortable atmosphere. There were common elements in the lounges such as window walls, widely matted floors and several low tables. In some facilities, there were sofas in a row along sidewalls that encouraged residents to venture out of their rooms and interact with other individuals.

Second, in analysis of residents' occupancy of lounges and hallways, a central garden offered a wide hallway area that could be used not only for strolling but also for various activities, such as group working, exercise, and conversation consequently reducing the overall rate of inactivity. Lounges that had a central garden and sofas along its walls saw the occupancy of its residents widely dispersed on the floor. A center hallway contributed to severe congestion in the lounge; additionally, a double hallway could lead to residents loitering or becoming inactive. Many residents spent their free time in the lounge sleeping, watching TV, or doing nothing. Thus, physical motivation was required to reduce inactivity during ordinary time.

This research indicates that there are a few important elements that encourage active living among residents.

First, the existence of a central garden and the seats (tables) surrounding it make residents' occupancy more dispersed and encourage them to be active.

Residents with wheelchairs generally do not appear in lounges and hallways except during mealtimes. However, in facilities with seats and tables in the hallways, wheelchair bound residents have no difficulty finding seats which leads to further interaction with other residents.

Second, in central garden type facilities, shorter distances between the lounges and hallways on the opposite side are likely to disperse residents' occupancy. This might be because residents sitting in other hallways can easily see what is happening in the lounge where most of the facility's programs take place.

Third, hallway corners are good places for residents to get together. Corners of hallways and the wall of a central garden encourage residents to interact with one another, even though programmed activities are conducted mainly in the lounge. This might be due to a feeling of privacy and intimacy provided by the relatively isolated location of corners, which means that residents who do not have severe dementia have an opportunity for privacy, free from the observation of staff. These corners have potential for activities that require sofas, tables, or equipment for individual activities such as finger exercises, chess, and other cognitive activities; they could also be used for planned interaction programs or unplanned collaboration on the part of small groups of residents.

Lastly, architectural regulations relevant to lounges and hallways in elderly welfare facilities need to be prescribed since those were the places that the residents spent a majority of their time and had the greatest influence on their social interactions of the elderly. With minimum guidelines in relation to those areas such as location, spatial composition and design elements, the founder and administration will be able to provide a more positive atmosphere and living condition for the elderly in skilled nursing facilities.

■ References

Almberg, C., & Paulsson, J. (1991). Group Homes and

- Groups of Homes (pp. 223-237), In W.F.E. Preiser, J.C. Vischer, & E.T. White (Eds.), *Design Intervention*. New York, NY; Van Nostrand Reinhold.
- Brawley, E. C. (1997). *Designing for Alzheimer's Disease*, New York, NY; John Wiley & Sons, Inc.
- Cohen, U., & Weisman, G. D. (1991). *Holding on to Home*, Baltimore, MD; The Johns Hopkins University Press.
- Kim, D. K. (1998). *A Study on the Layout Patterns and the Behaviors in the Public spaces of Residential Care Facilities for the Elderly People*, Seoul City University, Master's Thesis.
- Lee, M. A., & Ryou, O. K. (2004). Using behavior of corridor and lounge at the residence floor in skilled nursing facilities for the elderly. *Journal of Korean Home Economics Association*, 42(11), 31-45.
- Lee, U. S. (2003). *A Study on the Architectural Planning of Skilled Nursing Facilities for the Elderly*, Jinju National University, Master's Thesis.
- Leibrock, C. A. (2000). *Design Details for Health*, New York, NY; John Wiley & Sons, Inc.
- Pinet, C. (1995). *Nursing Home Design: Characteristics of Social Spaces and Social Behavior of Residents*, The University of Wisconsin-Milwaukee, Doctoral Dissertation.
- Regnier, V. (2003). *Design for Assisted Living*, New York, NY; John Wiley & Sons, Inc.
- Ryou, S. S. (2001). *A Study on the Design of Therapeutic Environment in a Nursing Home for the Elderly with Dementia*, Korea University, Master's Thesis.
- Son, S. J. (1999). *A Study on the Shared Space in Residential Part of Nursing Home for the Elderly*, Seoul City University, Master's Thesis.
- Song, D. Y. (1998). *A Study on the Architectural Planning of Wandering Space of Nursing Home for the Elderly with Dementia*, Ajou University, Master's Thesis.
- Song, W. (2002). *Space and Environment Design*, Seoul, Korea; Sigong.
- Yang, K. S. (2002). A study on the living activities of the elderly with dementia in skilled nursing facilities. *Journal of Architectural Institute of Korea (planning)*, 18(9), 95-104.
- <http://www.elder.or.kr> Korean Elderly Welfare Facilities Association
- <http://www.mohw.go.kr> Ministry of Health and Welfare

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