

A Study on the Living Environment of the Residents of the Dementia Care Village

The purpose of this study was to investigate the relationship between the needs for environmental improvement and dementia patients' activity of daily living (ADL) and behavior and psychological symptoms of dementia (BPSD) in dementia patients living in urban type dementia care villages. The subjects of this study were 70 households with cognitive impairment and dementia among residents of dementia care village in Gunsan City. The survey was conducted with the permission of their family. Frequency analysis and descriptive statistical analysis were performed on the main variables to analyze the characteristics of the subjects. Bivariate correlation analysis was performed to verify the relationship between the two variables. According to the analysis results, the order of environment improvement was in the order of entrance (51.4%), toilet and stairs (48.6%), kitchen (11.4%), bedroom and laundry room (10.0%). In the relationship between the variables, The ADL was correlated with age ($r=.315$, $p<.01$), BPSD ($r=.322$, $p<.01$) and living environment inconvenience ($r=.640$, $p<.01$) while, living environment inconvenience correlated with environment improvement need ($r=.669$, $p<.01$). This study suggests that improvement of the residential environment of dwellers in dementia care villages, especially the stairway and entrance hall is necessary.

Key words: *Dementia, Dementia care village, Environment improvement, Activity of daily living, Behavior and psychological symptoms of dementia*

Ok Kon Moon, Ph.D, Prof.^a, Dong Moon Yeum, Ph.D^b, Prof., Wan Suk Choi, Ph.D, Prof.^c

^aHowon University, Gunsan; ^bChangshin University, Changwon; ^cInternational University of Korea, Jinju, Republic of Korea

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Address for correspondence

Wan Suk Choi, Ph.D
Department of Physical Therapy,
International University of Korea, 965,
Dongbu-ro, Munsan-eup, Jinju-si,
Gyeongsangnam-do, Republic of Korea
Tel: 82-55-751-8293, Email :
wschoi@iuk.ac.kr

INTRODUCTION

As the elderly population increases, the number of older adults with dementia increases significantly. It is virtually impossible for a family member to take care of a demented older adult. The elderly with dementia should be responsible not only for individuals and families but also for society¹⁾. Dementia care villages are emerging as a social alternative to solve the problem of the elderly with dementia. Dementia friendly villages began to be built on the recognition that dementia should be solved by the country, not by individual families²⁾. The purpose of the dementia care villages is to improve the awareness of dementia patients based on a correct understanding of demen-

tia. Then, with the help of the village members, even if they have dementia, they will create a dementia-friendly community that will enable them to maintain their daily lives and participate in social activities³⁾.

Dementia care villages are classified into urban and rural type pilot projects according to regional characteristics⁴⁾. Both urban and rural areas are targeted at areas where vulnerable social groups such as the elderly, the disabled, and the national basic livelihood security. If the residential area is in the city, it is classified as urban type. However, it is classified as the rural type if it is located in the rural area and is vulnerable without medical institutions and pharmacies. Whether urban or rural, villagers become dementia partners, allowing dementia patients to have a

comfortable life⁵⁾. Dementia care villages have been designated and operated in six villages in three areas (Gangwon-do, Woncheon-gun Wolcheon-myeon, Chungcheongbuk-do Jungcheon-gun Gunseo-myeon, Jeollabuk-do Gunsan-si Buan-gun) since 2017 in South Korea^{6, 7, 8)}.

The residential environment of demented elderly is related to mobility and life satisfaction of demented elderly^{9, 10, 11)}. Among them, the space mainly used by the elderly with dementia, the general characteristics of housing, and the satisfaction of the residents are factors affecting the elderly with dementia¹¹⁾. The dwelling environment in which the demented elderly do not consider the characteristics increases the dependence of demented elderly. Therefore, improvement of the living environment that suits the characteristics of patients with dementia is a necessary for independent living of demented patients¹²⁾. In the case of Gunsan City, which is piloting the urban dementia village in cooperation with the Jeonlabukdo Metropolitan Institute of Dementia since 2017, the dementia village was built around an old rental apartment complex. Since the rental apartments designated as dementia villages have been built for decades, the residential environment is not friendly to dementia patients. For this reason, this study investigated the environmental improvement needs of dementia patients and their families in apartment complexes in order to help the operation of urban dementia care villages. Besides, we investigated the relationship between daily living skills and behavioral psychological symptoms and the need for improvement of the environment in dementia patients living in dementia care village.

SUBJECTS AND METHODS

Data collection and subjects

In this study, 1,999 households (2,427 persons) selected as urban villages for dementia were selected as a population, and 70 households with cognitive dysfunction and dementia were included. The public officials and investigators of the dementia care village in Gunsan city visited the households with permission of the guardian. The eight items (Entrance, toilet, kitchen, bedroom, the inside house, laundry room, stairs, etc.) in the checklist were checked face-to-face to check all items that needed improvement. Participants were 19 males and 51 females with an average age of 78.5 years.

Measurement Equipment

Activities of Daily Living (ADL) are the 11 items (meal, dress, bath, toilet, grooming, mobility, house-keeping, health care, meal preparation, telephone, postal mail, computer, and money management) related to daily life. The coding was changed to 0 if it can be performed alone, and to 1 when it is not. Thus, scores from 0 to 11 can be distributed, and the higher the score, the greater the difficulty in activities of daily living. Behavior and psychological symptoms of dementia (BPSD) is the scale of the symptoms of an older adult in daily life (roaming, aggressive behavior or anxious behavior, nervousness, hiding, guardianship). If the question and their condition match, they get 1 point, otherwise they get 0 points. Thus, scores from 0 to 4 can be distributed, and higher scores indicate more behavior and psychological symptoms. The living environment inconvenience was examined in seven areas (front entrance, toilet, kitchen, bedroom, laundry room, staircase, the inside house) that older adults frequent. A score of 0 for a safe environment and 1 for a non-secure environment were given. Thus, scores from 0 to 7 can be distributed, and the higher the score, the less secure the living environment. The needs for improvement of the environment is 7 areas (entrance, toilet, kitchen, bedroom, laundry room, stairs), 1 point if need improvement, and 0 points if not. Therefore, the score can be distributed from 0 to the maximum 6 points, and the higher the score, the higher the need to improve the living environment.

Data analysis

The main variables were frequency analysis and descriptive statistical analysis in order to analyze the characteristics of the subjects. Bivariate correlation analysis was performed to verify the relationship between the two variables. Statistical tests were performed at the 0.05 significance level.

RESULTS

General characteristics of subjects

The ages of the subjects ranged from 63 to 96 years, with an average of 78.5 years. The average ADL score for the activities of daily living was 3.79 out of 11, indicating that there is no major difficulty in daily activities. BPSD was predicted to have a low behavioral psychological symptom; mean 0.23 out of 4. The living environment discomfort was average 2.53 out

Table 1. Main characteristics of subjects

	minimum	maximum	mean \pm SD
Age	63	96	78.49 \pm 8.59
ADL	0.00	11.00	3.79 \pm 3.93
BPSD	0.00	2.00	0.23 \pm .54
Living environment discomfort	0.00	7.00	2.53 \pm 2.15
need for environmental improvement	1.00	3.00	2.17 \pm .78

ADL: activity of daily living, BPSD: behavior and psychological symptoms of dementia

of 7 points, and the need for environmental improvement was 2.17 on the average of 6 points (table 1).

Discomfort about the living environment and desire for improvement of the environment

In the living environment survey, subjects were uncomfortable in the order of bedroom (84.3%), laundry room (75.7%), kitchen and the inside house (68.6%), stairs (54.3%), bathroom (51.4%) and entrance (44.3%). However, the need for improve-

ment of the living environment was followed by the entrance (51.4%), toilets and stairs (48.6%), kitchen (11.4%), bedroom and laundry room (10.0%).

Correlation analysis

The ADL of subjects was statistically correlated with age ($r=.315$, $p < .01$), and positively correlated with BPSD ($r = .322$, $p < .01$) and living environment inconvenience ($r = .640$, $p < .01$). Living environment inconvenience also positively correlated with environment improvement need ($r=.669$, $p < .01$).

Table 2. Living environment inconvenience and environment improvement needs

Living environment inconvenience	frequency	%	Environment improvement needs	frequency	%		
Entrance	Yes	31	44.3	Entrance	Yes	36	51.4
	No	39	55.7		No	34	48.6
Bathroom	Yes	36	51.4	Bathroom	Yes	34	48.6
	No	34	48.6		No	36	51.4
Kitchen	Yes	48	68.6	Kitchen	Yes	8	11.4
	No	22	31.4		No	62	88.6
Bedroom	Yes	59	84.3	Bedroom	Yes	7	10.0
	No	11	15.7		No	63	90.0
Laundry Room	Yes	53	75.7	Laundry Room	Yes	7	10.0
	No	17	24.3		No	63	90.0
Stairs	Yes	38	54.3	Stairs	Yes	34	48.6
	No	32	45.7		No	36	51.4
Inside House	Yes	48	68.6				
	No	22	31.4				

Table 3. Correlation of main variables

	Age	ADL	BPSD	living environment inconvenience	environment improvement deed
Age	1				
ADL	.315**	1			
BPSD	0,178	.322**	1		
living environment inconvenience	0,142	.640**	0,193	1	
environment improvement need	0,048	0,224	-0,068	.669**	1

**p<.01

ADL: activity of daily living, BPSD: behavior and psychological symptoms of dementia

DISCUSSION

The residential environment of patients with dementia is highly related to the independence and satisfaction of patients with dementia. It is necessary to identify and improve the most uncomfortable facilities and environmental factors for dementia patients. The purpose of this study is to provide essential data for the improvement of the dwelling environment of the dementia family after investigating the need for improvement of the dwelling environment of the dementia patients and their families living in the urban dementia care village. The relationship between age, daily life, and BPSD was also examined.

The apartment complex, which has been designated as a dementia care village town, is a one side corridor type permanent rental apartment over 30 years old. Most of them are disabled people, old people, and national basic livelihood security. The place where the discomfort felt in the living environment did not match with the degree of need for improvement. In other words, although the bedroom was the most uncomfortable place in the living environment, the desire for environmental improvement was the entrance and the stairs related to the locomotion. The repair of the entrance which has the highest needs is classified into three types. The first was safety bar installation, the second was entrance threshold removal, and the third was slip prevention installation. Patients with dementia often have difficulty maintaining balance when putting on or taking off their shoes on the entrance. The installation of safety bars and anti-slip plates is a safety tool that can primarily help prevent falls and ensure safety in patients with dementia. In addition, patients with dementia often get caught in the threshold when they pass through the front door. The survey reflects the desire of dementia patients to move safely as they pass

through the front door by lowering or removing the threshold. The second requirement for facilities improvement is the toilet. As in the entrance, there was a high needs for installing safety bars and slip prevention plates in the bathroom. Toilets are generally one of the most frequent occurrences of falls where the bottom is slippery. Therefore, a safety bar and anti-slip plate are essential for a dementia patient with poor balance ability to safely use the toilet. Also, if a safety bar is installed around the toilet, it will be more comfortable to sit and get up after ease nature.

The third needs was the repair of the stairs. The stair repair needs ratio was the same as the toilet repair needs ratio. The stairway leading to the entrance of the apartment and the steps of the last stairway were all of the same material and were not distinguished, and no anti-slip tape or corner angles trim were applied to the corners of the staircase. Dementia Elders and their families are concerned about falling in and out of the house. Thus, prevention of fall should be the most necessary to maintain the safe and independent daily life of patients with dementia. These findings are similar to the results of a survey on the need for improvement in the residential environment of outpatients with stroke and spinal cord injuries undergoing rehabilitation¹³⁾. In their study, the needs for improvement of the residential environment showed a significant difference in the width of stairway or doorway, bathroom space, sink, toilet, bathtub, shower hanger, sink height, and space of living room, bedroom, kitchen, and veranda according to the type of disability.

Other studies, however, showed the highest needs in the toilet¹²⁾. Notably, in the restroom, 97% of the users requested to install the slip-tab, 81% to cope with the odor of the dirt, 76% to install the closet to the bedroom, 68% to install the handrail on the toilet wall, 64% needs for obstacle removal, 65% needs for

night lighting around the bathroom (without interruption of sleep), 63% to open the bathroom door, and 62% to light the bathroom at night. This result is since this study was conducted on rented apartments in provinces over 30 years old. However, it is considered that the previous study was aimed at dementia families living in Seoul and metropolitan area. In other words, the difference in the residential area and the living environment of the subjects may have influenced the results of the study. Next, kitchen, bedroom, and laundry room were in order; however, the needs was not high. As a result, the high needs for patients with dementia is related to the safe and comfortable locomotion the living space. The higher the quality of the facility environment, the higher the life satisfaction¹⁴⁾, and the physical environment which does not fit the desire of the demented elderly increases the dependency of demented elderly. Therefore, it is urgent to secure the safety of transfer in order to support the demented elderly to live a more independent life.

The older, the more difficult the daily life and the higher the BPSD score in this study. In the study of the predictive relationship between behavioral psychological symptoms and activities of daily living in the elderly with dementia in Seoul, 76.3% of the elderly in the community had more than one BPSD and the frequency of BPSD in all items increased with the severity of dementia¹⁵⁾. These findings are similar to the results of this study. In other words, those who have difficulty in activities of daily living have behavioral symptoms and many difficulties in the living environment. In other words, those who have difficulty in activities of daily living have behavioral symptoms and many difficulties in the living environment. These high levels of ADL and BPSD may predict dementia symptoms.

It is difficult to generalize the results of this study only for dementia residents in Gunsan City. However, it is noteworthy that the first survey of the need for environmental improvement was made for the urban dementia care villages, and the relationship between ADL and BPSD was investigated among the elderly living in dementia.

CONCLUSION

This study suggests that improvement of housing environment, especially the entrance and stairway, for the elderly residents of dementia care villages is a priority. In the future, it is necessary to investigate

the environmental improvement needs of dwellers living in care villages of urban and rural dementia as well as Gunsan, as well as a large-scale survey to understand BPSD of the elderly with dementia. Also, as the population of dementia increases, it is required to develop manuals for the improvement of the environment of dementia care villages in the local government or government.

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