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특정 유형들의 물리적 환경에서 치매노인들의 행태와 삶의 질 비교연구*

- 전통적 시설, 그룹홈 및 그린케어팜을 중심으로 -

Behaviors and Quality of Life of Residents with Dementia in Distinct Physical Environments

- A Comparative Study of a Traditional Setting, a Group Home, and a Green Care Farm -

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Abstract

The purpose of the study was to compare the behavior and quality of life of residents with dementia living in three distinct care settings: a traditional care facility in Canada, a group home in South Korea, and a green care farm in the Netherlands. The long-term observational study was conducted using Dementia Care Mapping tool across three care settings. Data were analyzed using Microsoft Excel and SPSS Statistics. Results showed that residents of the green care farm engaged in more social interactions and positive activities, while group home residents participated more in recreation, and those in the traditional facility exhibited greater withdrawal. These findings highlight that positively stimulating and homelike environments foster social engagement, whereas dull institutional settings reinforce passive behaviors.

키워드 : 치매노인의 행태, 삶의 질, 전통시설, 그룹홈, 그린케어팜, 관찰조사

Keywords : Behaviors of residents with dementia, Quality of life, Traditional facility, Group home, Green care farm, Observational study

1. INTRODUCTION

Dementia is an umbrella term used to describe a range of symptoms, observed in individuals affected by various neurological conditions that significantly interfere with their ability to maintain activities of daily living (World Health Organization, 2025). The growing number of people with dementia and the associated economic costs place a substantial burden on individuals, their family, caregivers, and nations. In Korea, the number of individuals with dementia is projected to approach 1 million by 2025, corresponding to an estimated prevalence of 9.17% among older adults, and the societal and economic costs were estimated at KRW 20 trillion in 2022 (Ministry of Health and Welfare, 2025; Shin et al., 2025).

For decades, the traditional medical model has been grounded in viewing dementia as a pathological disease. Influenced by this perspective, facilities for older adults with dementia have often adopted hospital-like physical environments. However, in such settings—where the needs and preferences of residents with dementia are insufficiently considered—residents frequently exhibit problematic

behavioral outcomes, including withdrawal, disengagement, and other related symptoms (Jain & Hogervorst, 2025; Kok et al., 2013; Lee et al., 2024; Texas Health and Human Services, 2024). However, through the continuous interest and research of environmental psychologists, architects, designers, and researchers, it has been revealed that the quality and attributes of the built environment exert a profound influence on individuals' health and behaviors (Charras, 2025; Charras et al., 2016; Davis et al., 2009; Dilani, 2006; Zeisel et al., 2003). Accordingly, diverse facility models—including person-oriented small group homes and nature-based green care farms, have emerged, recognizing the significant influence of the surrounding environment on the behaviors of residents with dementia. Although various models of dementia care facilities have emerged, systematic investigations that compare the quality of life (QoL) of residents across these settings remain scarce. Accordingly, the present study is aimed to compare the behavior and QoL of residents with dementia in a traditional facility and in alternative dementia care models, such as a group home and a green care farm.

2. METHOD

This study presents the observational data on the behaviors of residents with dementia living in three distinct

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care settings: a traditional care facility in Vancouver, Canada, a group home in Seoul, South Korea, and a green care farm located near Eindhoven, the Netherlands. The long-term observational data from each facility were gathered during three sessions (T1~T3) over a one-year period to minimize temporal bias. Because the observations were carried out under different research projects, they took place in different periods: in Vancouver during April and October 2012, and March 2013; in Seoul during April-May and September 2019, and January 2020; and in Eindhoven during January-February, May, and August 2024. Nevertheless, despite these differences in observation periods, it can be reasonably assumed that, within the same built environment, older adults living with the same condition of dementia would not display substantial variations in their fundamental behavioral patterns as a result of the timing of observation. Therefore, the data can be regarded as suitable for comparative analysis.

2.1 Settings

A traditional dementia care facility was selected as follows: (i) 10 dementia care facilities were randomly selected from a total 56 facilities within the Vancouver Coastal Health Authority, British Columbia, Canada; and (ii) through site visits, *Riverview Home* was identified as a traditional dementia care facility, as it accommodates a large number of residents per unit (30 residents), features a long corridor (approximately 40 m), and planned double-loaded layout.

To select a group home dementia facility in Seoul, a list of 25 facilities was compiled using information from the Seoul Metropolitan Government and the National Health Insurance Service. Subsequently, through site visits, a *Seoul Garden* group home accommodating 16 residents per unit was chosen to participate in the observational study.

To select a green care farm in the Netherlands, the Wageningen Care Farm Institute was requested to identify a facility that provides 24-hour accommodation, nursing, and care services for the purposes of the study. Accordingly, the green care farm *Windmill*, located near Eindhoven, was selected to participate. This facility converted from a former farm into a dementia care setting, consists of six independent houses, each accommodating 4~8 residents with dementia, as well as two daycare centers.

2.2 Participants

Inclusion criteria required participants to be residents aged 60 years or older, diagnosed with dementia, who had entered in the facility for at least one month and were able to ambulate with/without assistive devices. Exclusion criteria applied to residents who were bedridden or who stay in their private rooms during daytime hours.

Seven residents at *Riverview Home* (Vancouver), four

residents at *Seoul Garden* (Seoul), and seven in *Windmill* (Eindhoven) initially met the inclusion criteria. During the study period, two residents from *Riverview Home* and three from *Windmill* either passed away or relocated. The final analyses were based on data from 13 residents with dementia: five from *Riverview Home*, four from *Seoul Garden*, and four from *Windmill*.

To ensure anonymity and maintain confidentiality, pseudonyms were assigned to both the facilities and the participants. Ethical approvals were obtained from the Office of Research Ethics at Simon Fraser University, Vancouver, Canada and the Institutional Review Board of Yonsei University, Seoul, South Korea.

2.3 Measurement

The built environment was assessed using the Therapeutic Environment Screening Survey for Nursing Homes (TESS-NH) (Sloane et al., 2002), an instrument designed to evaluate the physical and psychosocial environmental features of nursing homes. The tool is composed of six domains: I) privacy/control/autonomy, ii) safety/security/health, iii) stimulation, iv) socialization, v) personalization/homelikeness, and vi) orientation. It rated on a scale from 0 (distinctly negative features) to 3 (more favorable features) for the most part.

The behaviors and QoL of the residents were measured using the Dementia Care Mapping (DCM) (University of Bradford, 2010). DCM is a observational framework for the evaluation of the QoL and quality of care from the perspective of residents with dementia. Within the DCM framework, Behavioral Category Codes (BCCs), consisting of 23 standardized codes, are employed to classify resident behaviors. By using these behavioral profiles, levels of potential engagement and withdrawal can be assessed as key determinants influencing residents' QoL. A trained mapper observed participants' behaviors and recorded the corresponding behavior codes at five-minute intervals during the daytime in a public areas. To obtain comprehensive data, each resident was observed for a minimum of four hours, with observations typically extended over 2~3 days.

2.4 Data analysis

All analysis were conducted using Microsoft Excel and SPSS Statistics (v.31). Descriptive statistics, analysis of variance (ANOVA), and the Shapiro-Wilk test were applied to assess group differences, with statistical significance set at $p < 0.05$.

3. RESULTS

Table 1 presents the general characteristics of the participants and care facilities, together with the results of the ANOVA. Table 2 shows the behavioral category profiles and three indicators of residents' QoL—high potential engagement, withdrawal, and agitation/distress—.

Table 1. General Characteristics of the Residents and Results of *F*-test on Physical Environmental Features

		Riverview Home (n=5)	Seoul Garden (n=4)	Windmill (n=4)	<i>F</i> -value(df)
Residents	Age Mean(SD)/range	77.6 (9.8) / 62-88	75.5 (11.4) / 64-89	86.5 (1.5) / 85-88	-
	Male/Female f (%)	2(40.0)/3(60.0)	3(75.0)/1(25.0)	2(50.0)/2(50.0)	
Physical Environmental Features	Facility type	Traditional facility	Group home facility	Green care farm	-
	Bedroom type	Mixed single & semiprivate rooms	Mixed single & four rooms	Single bedrooms	
	Number of residents in a unit	30 residents	16 residents	4-8 residents	
TESS-NH mean(SD)	Privacy/control/autonomy	1.43(1.16)	1.07(1.07)	2.36(2.24)	N.S.
	Safety/security	1.30(0.79)	1.74(0.69)	1.70(0.70)	N.S.
	Stimulation	0.85(0.75)	1.43(0.59)	2.10(0.55)	F(2,57)=13.90***
	Socialization	0.40(0.70)	0.33(0.48)	0.11(0.93)	N.S.
	Personalization/homelikeness	0.92(1.63)	0.92(0.80)	2.83(0.57)	F(2,15)=14.61***
	Orientation	0.54(0.52)	0.46(0.52)	0.54(0.52)	N.S.
Visual materials					
	< Public space_Riverview Home > < Unit floor plan_Seoul Garden > <Photos_Windmill >				

Table 2. Profiles of Behavioral Category Codes and Results of *F*-test

Behavioral Category Codes	Riverview Home				Seoul Garden				Windmill				<i>F</i> -value (df)
	Mean(%)	(T1	T2	T3)	Mean(%)	(T1	T2	T3)	Mean(%)	(T1	T2	T3)	
A. Interaction with others	8.6	(7.8	9.5	8.5)	12.8	(11.8	11.1	15.6)	29.2	(21.4	36.7	32.2)	F(2,6)= 18.05**
B. Being engaged but passively (watching)	26.5	(15.9	33.2	30.3)	18.9	(18.9	19.6	18.2)	27.7	(39.3	14.4	25.0)	N.S.
C. Being disengaged, withdrawn	18.9	(42.1	8.6	6.0)	2.7	(1.5	2.0	4.5)	0.0	(0.0	0.0	0.0)	N.S.
D. Self-care	0.6	(0.0	0.5	1.4)	2.8	(2.7	1.8	3.8)	1.4	(0.5	1.7	2.2)	N.S.
E. Expressive or creative activities	1.2	(0.0	2.0	1.6)	0.9	(2.2	0.6	0.0)	0.9	(0.9	0.5	1.4)	N.S.
F. Eating/ drinking	14.4	(12.6	16.3	14.5)	9.9	(9.8	9.4	10.5)	16.5	(15.4	15.9	18.1)	F(2,6)= 17.59**
I. Prioritizing the use of intellectual abilities	0.0	(0.0	0.0	0.0)	0.4	(0.0	0.0	1.3)	0.7	(1.2	0.3	0.6)	N.S.
J. Exercise or physical sport	1.3	(0.0	3.4	0.5)	2.5	(0.0	2.9	4.5)	0.0	(0.0	0.0	0.0)	N.S.
K. Walking, standing or moving activities	7.0	(4.2	7.7	9.0)	6.5	(6.9	6.7	6.1)	11.3	(13.9	10.4	8.9)	N.S.
L. Leisure, fun and recreational activities	1.8	(2.9	0.7	1.9)	25.3	(35.3	19.9	20.7)	2.4	(1.4	5.7	1.0)	F(2,6)= 19.16**
N. Sleeping, dozing	16.6	(13.8	16.0	19.9)	9.6	(4.7	19.0	5.1)	2.5	(2.2	3.0	2.4)	F(2,6)= 5.83*
O. Displaying attachment to inanimate objects	1.1	(0.0	0.5	2.8)	1.0	(2.2	0.9	0.0)	0.1	(0.0	0.0	0.2)	N.S.
P. Receiving practical or personal care	1.3	(0.7	1.1	2.1)	2.7	(2.2	3.8	2.2)	0.5	(1.4	0.0	0.0)	F(2,6)= 5.84*
T. Direct engagement of the senses	0.0	(0.0	0.0	0.0)	0.3	(1.0	0.0	0.0)	1.8	(1.4	3.7	0.8)	N.S.
U. Communicating without receiving a response	0.4	(0.0	0.0	1.1)	0.3	(0.2	0.0	0.6)	0.0	(0.0	0.0	0.0)	N.S.
V. Work or work-like activity	0.2	(0.0	0.5	0.2)	0.7	(0.2	0.6	1.3)	2.6	(0.3	4.2	3.8)	N.S.
W. Repetitive self-stimulation	0.0	(0.0	0.0	0.0)	0.7	(0.2	0.6	1.3)	0.0	(0.0	0.0	0.0)	N.S.
X. Episodes related to excretion	0.1	(0.0	0.2	0.0)	1.1	(0.2	1.2	1.9)	2.4	(0.7	3.5	3.4)	N.S.
Y. Interaction in the absence of other	0.0	(0.0	0.0	0.0)	0.8	(0.0	0.0	2.5)	0.0	(0.0	0.0	0.0)	N.S.
Total	100.0	(100.0	100.0	100.0)	100.0	(100.0	100.0	100.0)	100.0	(100.0	100.0	100.0)	
High Potential Engagement (corresponds to codes A,D,E,F,I,J,K,L,O,T,& V)	36.3	(27.5	41.1	40.4)	62.5	(69.9	53.9	63.8)	68.2	(56.4	79.1	69.2)	F(2,6)= 10.28*
Withdrawal (corresponds to codes C and N)	35.5	(55.9	24.6	25.9)	12.3	(6.2	21.0	9.6)	2.5	(2.2	3.0	2.4)	F(2,6)= 6.89*
Agitation & Distress (corresponds to codes U, W, Y)	0.43	(0.1	0.1	1.1)	1.8	(0.4	0.6	4.4)	0	(0.0	0.0	0.0)	N.S.

df: degrees of freedom * $p < 0.05$ ** $p < 0.01$ N.S.: not significant

According to the ANOVA results, the domains of stimulation ($F_{(2,57)}=13.90^{***}$) and personalization/homelikeness ($F_{(2,15)}=14.61^{***}$) in the physical environment showed statistically significant differences among the care homes. This findings indicate that the green care farm *Windmill* provided a more positively stimulating environment and a more homelike atmosphere compared to the other facilities.

The ANOVA results of the DCM indicated that residents of *Windmill* engaged in significantly higher levels of interaction with others and spent more time having meals and tea, showing greater positive engagement with their surrounding environment compared to those in other care homes. In contrast, residents of the group home *Seoul Garden* devoted significantly more time to recreational activities and to receiving personal care from care aides, whereas residents of the traditional facility *Riverview Home* spent more of their daytime sleeping or dozing, reflecting greater withdrawal compared to those in other facilities.

3. DISCUSSION AND CONCLUSION

This long-term observational study examined the behavior and QoL of residents with dementia across three distinct physical environments. The results demonstrated that residents living in a positively stimulating and homelike environment exhibited more social interaction with others and greater positive engagement with their surroundings, whereas those in a traditional setting characterized by a dull and institutional atmosphere spent more time sleeping or withdrawing. Interestingly, residents of *Seoul Garden* spent less time having meals and snacks but devoted more time to recreational activities compared to the other cohorts. These findings align with previous studies (Brennan & Doan, 2023; Lee et al., 2016; Marquardt et al., 2014; Steinmann, Hamers, & Verbeek, 2025). However, the generalizability of this study to the broader population of older adults with dementia and to other dementia care facilities is limited due to the relatively small sample size and the lack of consideration for personal characteristics. Despite these limitations, the long-term observational study provides significant and valuable insights for the planning and design of physical environments for older adults with dementia.

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