

The Effects of Residential Satisfaction on the Quality of Life of Aging people: Comparison between the Elderly Living in the Community and the Elderly Living in Senior Housings

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Abstract

The purpose of this study was to analyze the direct and indirect effects of residential satisfaction on the quality of life and to analyze the difference according to the residence type. The subjects of this study were 422 elderly people aged 65 or older residing in two metropolitan municipalities. The data were analyzed by using structural equation model by multi-group analysis. The results showed that the degree of satisfaction with the residential environment indirectly affected not only the quality of life of the elderly but also social participation activities. As a result of verifying the difference of the residential satisfaction and quality of life path according to the residence type, there was a difference in the route between groups according to the type of residence. This study is significant in that the elderly who have not been interested in the elderly housing policy have been investigated and the relationship between the residential satisfaction and quality of life of the elderly by residence type has been investigated .

Keywords: *Residential satisfaction, residence type, quality of life, structural equation model, aging in place*

1. Introduction

The living environment has a profound impact on human life. Living space is the most time-consuming place in life and at the same time a contact with the most important people in the social network, and is also a symbolic product representing the major financial and personal investment for most people[1]. In particular, it is necessary to establish a residential environment and a community activity environment that can maintain and supplement the adaptation ability to the living environment due to the weakening of physical functions and the possibility of experiencing psychological loneliness and social inactivity in the old age[2]. Academic discussions on the residential environment of old age have been widely discussed in various fields such as environmental psychology, housing, and geriatric science. These results have shown a tendency to demonstrate the specificity and relative importance of the impact of the residential environment on the old age. The results of previous studies show that poor residential environments have a significant impact on physical, mental, and social dimensions. The poor living environments are characterized by low psychological welfare[3], subjective well-being[4][5], life satisfaction [6]. However, previous research on the impact of the residential environment is still not sufficient in many respects. First, the results of the effects of the residential environment on the well-being or health are accumulating, but there are insufficient studies to analyze the actual mechanisms that cause mental or physical consequences. Some research has only reported the direct effect of the residential environment on subjective well-being and mental health[7]. Studies that have identified pathways and mechanisms that have actual effects are very rare. Second, previous studies tended to focus on the physical environment in defining the concept of residential satisfaction. Studies that have explored the impact of the residential environment using the concept of residential environment including some social dimensions have

only attempted to analyze the neighborhood environment[5]. Research using the broad concept of physical, social, and psychological aspects of the residential environment is rare. In addition, the studies on the relationship between the satisfaction of the elderly residential environment and the quality of life are not enough to verify the difference according to the residence type. It is necessary to clarify the difference of residential satisfaction and quality of life between elderly people living in community and elderly people living in elderly housing. Leaving a familiar environment that has lived for a long time in the old age has a profound effect on the social world of the elderly[8]. It is necessary to investigate how the lives of elderly people living in community(aging in place) and elderly people moving to elderly housing facilities are different. The purpose of this study was to analyze the direct and indirect effects of the satisfaction of residential environment on the quality of life of aging people in Korea. Also, the purpose of this study was to analyze the difference of residential satisfaction and quality of life according to the type of residence.

2. Theoretical background

2.1 Meaning and evaluation of the Elderly residential environment

The relationship between housing and health from the environment geriatric point of view is based on the ecological theory of aging[9] [10], and the person-environment congruence model[11] [12]. Lawton (1985) used ecological models and found that human adaptive behaviors are the result of interaction between personal characteristics (physical health status, cognitive status) and environmental characteristics (demographic, human, and physical environment). In other words, adaptation behaviors such as human depression and emotional responses such as life function are phenomena that are caused by the interaction of environmental factors including the physical environment such as housing, with individual ability. In addition, according to Kahana (1975), the psychological well-being and appropriate functioning of human beings are the result of close fit between personal needs, preferences, and perceived environmental dimensions. Thus, human adaptive capacity is determined by the correspondence between human needs and environment. A common key assumption of these models of aging is that the outcome of human-environment interactions is determined not by individual competence or environmental conditions but by the individual level of human-environmental fitness. Both theories have shown that the balance between personal competence and environmental pressures becomes more and more unstable as they move towards older age, which is due to a gradual decrease in adaptive capacity with aging. Therefore, it is necessary to provide a residential environment that can compensate for reduced adaptation capacity in old age. On the other hand, the concept of a residential environment remains somewhat ambiguous, with no consensus or definition. The concept of residential environment has a tendency to be defined as a mixture of physical conditions and social factors related to the residential environment in general. That is, there is a strong relationship between the satisfaction of the residential environment and neighboring facilities, neighborhood environment, living facilities, basic social infrastructure, Etc[6]. In addition, in some studies, the concept of residential environment was concentrated on social concepts, and it was composed of six categories such as socio-economic composition of neighborhood, ethnic composition, demographic factors, perceived resources and problems, physical environment, and social environment[13]. In recent years, there have been various kinds of precise measurement tools for measuring the satisfaction with the residential environment, including four macro dimensions such as physical, functional, social, and situational aspects[14]. Some studies that attempted to define the satisfaction with the residential environment in terms of material conditions typically included physical factors, a set of environments, and functional conditions[15]. In some studies, the physical environment has been defined in terms of created environment, open space, green space, road view, regional resources and safety[16]. In addition, it has also been measured as a service and functional aspect of the environment and organization, including the abundance of residential environments and entertainment, commercial and transportation services[14]. This concept,

which consists of physical environment and functional condition, usually includes three dimensions including geographical background conditions, physical factors related to residential life, and degree of social interaction. Based on the concept definition of the residential environment, the previous research has developed various evaluation tools to verify the impact of the residential satisfaction. The evaluation of the residential satisfaction so far has been based on the definition of the residential environment, the existence of each element selected, or the way in which the function itself is measured, and the degree of individual's evaluation or perception of the residential environment factors including such individual factors. Thus it has been done on two levels. In the natural sciences such as housing, and architecture, the former method seems to have been written mainly, but the latter method seems to be preferred in the environmental geriatric and sociological aspects. Especially, the latter, the degree of individual perception of the objective factors of the residential environment has been defined as the concept of residential satisfaction or residence satisfaction.

2.2 Review of research on the relationship between residential environment and quality of life

Housing has direct, indirect and multidimensional influences on individual health levels. In general, housing includes housing as a physical location and housing as a social meaning, while the physical environment of housing has a direct effect on health, while the housing of social meaning indirectly influences [17]. In the extension of these results, the study has proceeded in two dimensions. In other words, one is to investigate the direct and indirect effects of living environment on health or mental health including housing concept of social meaning.

First, studies focused on the physical dimension of housing focused on the health effects of the obstacles in the physical environment. According to such studies, residential environments such as heat, air, noise and light[18], and residential environments such as moisture, noise[19], have a close relationship with health. Poor housing is vulnerable to referral environment, noise, safety and intrusion, thereby affecting mental health, including anxiety, depression, insomnia, and paranoia[20]. Also the neighborhood environment and mobility around the house are closely related to the quality of life[21][22][23].

Second, studies that attempted to demonstrate the wide range of direct and indirect effects of living conditions on the residential environment, including the social meaning of housing, show that the perception or assessment of their residential environment is linked to the subjective assessment of current living standards. These studies mainly focused on the multidimensional dimension of the neighborhood, such as socioeconomic composition, socio-demographic factors, perceived resources and problems, physical environment, and social environment, and the subjective evaluation of residential environment was also related to the quality of life, life satisfaction, and subjective wellbeing of aging people. This type of prior research has reported that satisfaction with the residential environment affects social well-being and quality of life[24]. Especially, in the previous studies, there have been a number of studies to examine the relative influence of the neighboring environment, paying attention to the characteristics of the neighboring environment among the residential environment factors. In these studies, neighboring environmental factors have an effect on subjective well-being[25] [26]. In addition, among the residential environment factors, the evaluation of the location of residence related to mobility is related to life satisfaction[21]. Specifically, mobility, participation in social activities, degree of traffic congestion, location of residence, city size had a close relationship with life satisfaction. In summary, prior research tends to concentrate only on the objective aspects of the residential satisfaction, so that the direct and indirect effects of satisfaction on the residential environment, including emotional and psychological aspects such as emotional aspects such as meaning of the house[27].

3. Research method

3.1 Subjects

The subjects of this study were elderly people aged 65 years or older residing in the communities and elderly housing facilities in two metropolitan municipalities. The survey was conducted by social workers trained in February-April 2017 in a one-on-one interview. A total of 430 cases were collected. However, except for cases with a large number of missing cases, a total of 422 persons including 207 residents of senior housing and 215 residents living in the community were included in the final analysis.

3.2 Measurement tools

The quality of life(QOL), which is a dependent variable of this study, was measured by the Korean version of the World Health Organization Quality of Life, WHOQOL-BREF by Min, Kim, & Park(2002). This tool consists of 26 items that ask questions about general quality of life, health status, physical dimension, psychological dimension, social dimension, and environmental dimension. The five-point Likert scale from 'not at all' to 'very agree' means that the higher the score, the higher the quality of life. In this study, the reliability was Cronbach's $\alpha = .89$. Residential satisfaction which can be considered as an independent variable of this study, was reconstructed based on the questionnaire scale designed by the method of residence satisfaction or residential environment evaluation. Specifically, the detailed items are based on the measures written by Asami Yasushi (2003), Kim Sang Hee et al. (2004) and Park Young Ki et al.(2005), and the emotional and psychological factors[28]. The questionnaire consisted of 21 items. The total score is composed of 5 point Likert scale. The higher the score, means the higher the satisfaction of residence. In this study, the reliability was Cronbach's $\alpha = .92$. Social participation was measured by the five points from 'not at all' to 'actively active' by dividing the current activities into six categories. Specifically, there are simple social fellowships such as neighborhood association, aging society meeting, association of senior citizen, participation of senior citizen welfare center, alumni association, symposium, religious meeting, volunteer activity group. It means the higher the score, the higher the level of social participation. In addition, the health status was responded to the 5-point Likert scale from 'very bad' to 'very good'.

3.3 Analysis method

The analytical method used in this study is a multi-group analysis applying the structural equation model. The structural equation model incorporates various factors that are not measured in other analytical methods as a measurement error, and it is suitable for the subject of this study[29] because it can analyze the path of complicated relation of main variables at once. In order to verify the hypothesis, we used the variables of the structural equation model to improve the possibility of satisfying the assumption of multivariate normality, reduce the number of parameters to be estimated. First, the quality of life scale was used as an observation variable by item parceling based on the sub-factors, and the social participation variables without sub-factors had to utilize the total score of the individual items. The research model became a hybrid model. In the actual model estimation, theoretically competing model is determined by comparing the chi-square value and the fitness index. In order to confirm the fit of the research model, we used χ^2 as the absolute fit index, standard χ^2 validation (CMIN/DF), Tucker-Lewis index (TLI), and the RMSEA of the approximate error mean square (RMSEA). PASW 22.0 and AMOS 22.0 programs were used for statistical analysis.

4. Results

4.1 General characteristics of subjects

The results of the survey on the demographic characteristics and major variables of the subjects are shown in Table 1.

Table1 . Characteristics of subjects

	Senior housing residents (N=207)		Community residents (N=215)		Significance level	
	n	%	n	%		
	M±SD		M±SD			
Demographic characteristic						
Age	77(65-96) ±7.2		73(65-91)±5.8		p<.001(T)	
Sex	M	53	25.6	M 126	59.2	p<.001(χ ²)
	F	151	72.9	F 89	40.8	
Educational level						
Primary school	99	47.9	33	15.3	p<.001(χ ²)	
Middle school	28	13.5	40	18.6		
High school	38	18.4	69	32.1		
Junior college and above	39	18.9	71	34.0		
Health condition						
Very bad	18	8.7	6	2.8	p<.01(χ ²)	
Bad	48	23.2	28	13.0		
Normal	87	42.0	11.3	52.6		
Good	46	22.2	54	25.1		
Very good	8	3.9	14	6.5		

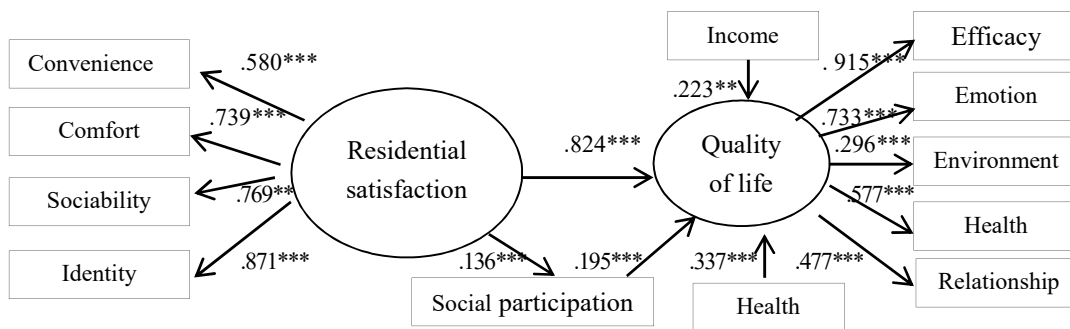
The average age of the elderly welfare housing residents was 77 years old and the average age of the community residents was 73 years old. In terms of gender, the proportion of the elderly housing occupied 72.9% of the women, but the proportion of the residents of the community was higher(59.2%). In terms of education level, residents of elderly housing are more likely to be low education graduates(47.9%), while those living in the community have a relatively high ratio of high school graduates(32%) and college graduates (34%). Satisfaction of residential environment was higher in residents of elderly housing(75 points) than in residents of community(70 points) were almost similar, but residents in the community were one point higher.

4.2 Basic statistics of major variables

This study examines the correlation, mean and standard deviation between the main variables and the Z-score for univariate outliers in order to examine the normality of the main variables before the structural equation model is applied, Mahalanovis distance check for verifying the multivariate outliers, and confirmation of the kurtosis and kurtosis of each variable. As a preliminary procedure of the structural equation model verification, the correlation of major variables and basic statistical results of major variables are shown as follows. First, the magnitude and kurtosis of the measured variables are found to be in the range of -0.7 to 0.2 and the kurtosis values in the range of -1.0 to -0.4, indicating that the main variables have no problem with the condition of regularity[30]. Next, the correlation between variables showed a positive correlation between quality of life and residential satisfaction, quality of life with social participation, residential satisfaction and social participation.

4.3 Residential satisfaction and quality of life

This study needs to evaluate whether the research model that is set as the process of analysis of the structural equation model appropriately reflects actual data. To this end, we analyzed the suitability of measurement model and structural model. First, confirmatory factor analysis was used to verify that the measurement model designed as a latent variable is appropriate[30]. As a result of the analysis, the model fit was $\chi^2 = 29.7$ (df = 13), $p = .005$, CFI = .991, TLI = .975 and RMSEA = .050. In addition, the factor loadings of the measured variables for individual latent variables were all significant and showed sufficient load of 0.5 or more. These results show that the measured variables of this study adequately reflect each latent variable. Since the suitability of the measurement model has been confirmed, the conformity of the structural model was analyzed. As a result of the analysis, the fit of the model assuming the mediating model between the residential satisfaction and the quality of life related to social participation was $\chi^2 = 29.955$ (df = 21), $p > .05$, CFI = .996, TLI = .987, RMSEA = .032 indicating that the structural model is also appropriate for the data of the study.



$\chi^2 = 29.955$ (df=21), CFI=.996 , TLI=.987, RMSEA=.032, *** $p < .001$, ** $p < .01$, error margin omitted

Figure 1. Structural model verification

Social participation showed mediating the relationship between residential satisfaction and quality of life. The effect of the residential satisfaction on quality of life was partially mediated by social participation. The results of this study are summarized as follows.

Table 2. Effect decomposition

Path	Direct effects	Indirect effects	Total effects
Living environment satisfaction → Quality of life	.824***	.026***	.850***

*** $p < .001$

In summary, residential satisfaction directly affects quality of life($r = .824$, $p < .001$). In addition, the residential satisfaction had a statistically significant effect on social participation($r = .136$, $p < .01$), and social participation had a statistically significant effect on quality of life($r = .195$, $p < .001$). In addition, the prevalence of quality of life($r = .223$, $p < .001$) and health status ($r = .337$, $p < .001$). The results of the structural model analysis show that the residential satisfaction directly affects the quality of life and also indirectly effected on the relationship between the residential satisfaction and quality of life by social participation.

4.3 Comparison of the relationship of the residential satisfaction and quality of life according to type of residence

The purpose of this study was to examine the differences in the path of the structural model according to the residence type. First, it is confirmed that the structural model set in this study is suitable for multi-group analysis data of elderly housing group and community resident group. As a result of the analysis, the model fit was found as $\chi^2 = 93.454$ (df = 40), $p > .05$, CFI = .976, TLI = .921 and RMSEA = .050. The multi-group

analysis is a process to check whether the measurement model and the structural model are identical. In order to verify the validity of the measure identity, it is necessary to verify whether the result of the factorial factor between each group is the same. Verification of the structural identity is to check whether there is a group difference in each path after restricting the path coefficients[36].

1) Verification of measurement identity

In order to verify the measurement equality, the model with no equality constraint on the factor of each residence type was used as the base model, and the model with the equality constraint on the factor of each group was used as the constraint model. The difference was confirmed. The fit of the baseline model and the measurement identity model was both encouraging. The difference between the χ^2 values of the base model and the constraint model is 10.828(df = 7), which is smaller than the critical value of 0.05 (14.07). As a result, there is no significant difference between the two models.

2) Verification of structural identity

Next, in order to find out the significant difference between the path coefficients existing between the groups, the model with the equality constraint and the base model without the equality constraint were set for each of the path coefficients, and the difference between the two values was confirmed. First, there was a significant difference in terms of residential satisfaction and quality of life when compared to the non-constraint model. In addition, it was found that there was a significant difference in all pathways after examining the difference between the non-constrained model and the constraint of the residential satisfaction, social participation, social participation and quality of life.

Table 3. Results of Path constraint

Constraint of path	χ^2	df	$\Delta\chi^2(df)$	Significance(constraint model - non-constraint model)
Non-constraint model	93.454	40		
Residential satisfaction → Quality of life	110.236	48	16.782(8)	Significant
Residential satisfaction → Social Participation	118.945	49	25.491(9)	Significant
Social participation → Quality of life	120.716	50	27.262(10)	Significant

The coefficients of the pathways that are found to have significant differences between the two groups are shown in Table 4. The effects of residential satisfaction on quality of life were similar in both groups. On the other hand, the effect of the residential satisfaction on social participation was found to be significant only in the community resident group. On the contrary, the effect of social participation on the quality of life was significant only in the resident elderly housing group. In addition, the income and health status of the model were found to have a significant effect on the quality of life.

Table 4. Path coefficients by residence type

Path	Senior housing residents (Path coefficient)	Community dwelling residents (Path coefficient)
Residential satisfaction → Quality of life	.840***	.846***
Residential satisfaction → Social Participation	.046	.297***
Social participation → Quality of life	.240**	.109

*** $p < .001$, The coefficient is the standardized regression coefficient.

5. Conclusion and Suggestions

This study showed that the degree of satisfaction with the residential environment indirectly influences the quality of life of the elderly as well as through social participation activities. These results suggest that the various physical, emotional, social and convenient environmental factors derived from the elderly living environment directly affect the quality of life. It can be interpreted as indirectly enhancing the quality of life related to old age. The results of this study, which confirms the indirect influence or path of social participation, is significant in that it presents the mechanism of social participation that influences the evaluation of the residential environment in the old age and the quality of life. This study proves that residence in old age becomes a means to connect with society beyond simple physical residence space and plays a role of enhancing quality of life through connection with such society.

Second, as a result of verifying the residential satisfaction and the quality of life path difference according to the residence type, there was a difference in the route depending on the residence type. The results of this study are as follows. There was a significant difference in the pathway between the two groups. In other words, the effect of the satisfaction of the residence environment on the social participation was significant in the community resident group, whereas the effect of the social participation on the quality of life was significant only in the resident senior housing group. The results can be interpreted as follows: first, the elderly residing in the elderly residence does not much lead to social participation. In addition, the elderly residents in the community are more likely to be effected by the degree of social participation where as they does not seem to affect the quality of life. The reason for the difference in residence type is as follows. In the case of residents living in the community, living in various forms of residence such as general housing, apartment, and villa, there is a high probability that individual differences in the physical environment of the residence are high. On the other hand, elderly houses which have been surveyed in this study are living in averaged residential environment which has somewhat different housing environments. In other words, it is possible that the influence on the satisfaction of the residential environment may be different considering that it is a similar sized apartment type and it is located in the rural areas of small and medium cities and most of them are newly built buildings less than 10 years old.

The implications of this study are summarized as follows. First, the results of this study have once again proved the importance of the elderly residential environment. The residential environment directly or indirectly affects the quality of life among elderly, thus confirming the importance of the elderly housing welfare policy in order to improve the quality of life for the elderly. Thus, the results of this study show that the housing space in the old age is a place for communication with the society and the communication with the society increases the quality of life in older people. Second, the results that the effect of the residential satisfaction on the quality of life differs according to the type of residence suggest that differentiated residential welfare policies for the elderly should be implemented based on the results of this study

This study have limitations in that this study collected and analyzed a sample of convenience methods from five cities located in two regional municipalities such as Chungnam and Jeonbuk. Because the sample size is not large and is limited to a specific geographical range, it has limitations in generalizing the results of the study. Despite the limitations of this study, the present study could be meaningful in that this study investigated the relationship between residential satisfaction and quality of life for elderly people who have not been surveyed enough yet. Furthermore, it is meaningful that the elderly living in the senior housing and the elderly residing in the community are sampled and the suggestions are presented through comparison between the groups. I hope this findings added new evidence on role of the residential environment in enhancing the quality of life of elderly people.

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