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The State of Housing of the Elderly with Vision Impaired and the Its Impacts on Quality of Life

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Abstract People have experienced physical problems including vision problems with aging; some are normal and some are abnormal. When they have abnormal and impaired vision, they have a lower level of life satisfaction than their sighted peers. For the elderly with sight loss, well-designed housing could be an important indicator for their quality of life. Housing adjustment and modification could help the elderly cope with sight loss, do daily activities more independently, and lead to better quality of life. The purpose of this study is to investigate housing conditions for the elderly with vision impaired, state of housing adjustment or modifications, and the effects of housing conditions on the wellness of the elderly in Korea. For this study, 18 housing cases were investigated and a total number of 65 visually impaired people aged over 55 participated. Housing condition of those participated was poor. Most observed home hazards are level differences in living areas, obstacles in the hallway, confined space that is not allowed structural modification, swing doors from wardrobe or cabinets, color contrast, poor lightings, and etc. Majority of households participated in this study did not make modification or refurbishments, rather many of them tend to adapt themselves to their residential environments. Older adults living in better housing condition and under less difficult environments are likely to have higher life satisfaction. The effects of housing condition on wellness could be more influential when individual capabilities (e.g. health condition) are weaker. The findings underline that with intervention of individual characteristics, the effects of housing and physical environment on negative outcomes of vision loss would get ameliorated or reduced.

Keywords: Vision Impaired; Housing Condition; Housing Modification; Quality of Life; Elderly

1. INTRODUCTION

Older adults confront visual impairment as a common chronic condition including physical disabilities with ages (Wahl, Oswald, & Zimprich, 1999). Globally, 82% of people with blindness are aged 50 and above[1]. In Korea, 76.4% of people with visual impairment are aged 50 and above and 90.3% of visually impaired people are due to postnatal accidents or disease (Korea Institute for Health and Social Affairs, 2014). Visual impairment is also linked to functional declines that affect quality of life for the elderly relating to their physical environment (Lawton, 1982; Wahl et al., 1999). Since vision status including visual acuity, contrast sensitivity, depth perception and loss in visual fields is known to be associated with increased fall risks (Steinman, Pynoos, & Nguyen, 2009), injuries of falls or accidents of older adults with visual impairment would be more serious and greater concerns.

The common hazards found in homes for the people with sight loss would be confined space, unseen small objects, projecting items of furniture, inadequate lighting, unsafe/insecure floor surface, staircases with no railings, poorly designed or arranged furniture, poorly designed tubs, toilets and fixtures on the bathroom, and etc. (Percival, Hanson, & Osipovic, 2006; Wahl et al., 1999). Older adults with visual impairment have a vulnerability to contingencies in the home.

For the elderly with sight loss, well designed housing could be an important indicator for their quality of life. Housing adjustment and modification could help the elderly to cope with sight loss, do daily activities more independently, and lead to better quality of life (Gitlin et al., 2006; Riazi et al., 2012). However, there are few regulations and guidelines adequately address issues of sensory accessibility (Allen, Milner, & Price, 2002). Housing for visually impaired people should provide specific housing requirements and priorities in needs for them. Therefore, the purpose of this study is to investigate housing conditions for the elderly with vision impaired, state of housing adjustment or modifications, specific housing needs and analyze the effects of housing conditions on the wellness of the elderly with sight loss in Korea.

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[1] World Health Organization, retrieved from http://www.who.int/mediacentre/factsheets/fs282/en/ in May, 18, 2014.

2. LITERATURE REVIEW

2.1 Home Modification and Adjustment of the Elderly with Vision Impaired

In search for a housing, there is a lack of information for the people with vision impaired and the lack of proper information regarding housing unable them to develop a proactive role as users of housing (Percival & Hanson, 2007).

Therefore housing conditions is important for independence for the people with vision impaired. Environmental adaptation is of great importance, since major improvements of functional capacity in the frail elderly may be difficult to achieve (Iwarsson & Isacsson, 1997). Modifying the homes could reduce hazards and eventually result in reducing or preventing falls (Day et al., 2002; Steinman, Pynoos, & Nguyen, 2009). According to a study done by Hanson & Percival (2005), approximately a half of the participants had made physical alterations or adaptations to their homes to cope with visual impairment. Home modification includes removing cords from the floor, changing lighting fixtures, installing grab bars, elevating the toilet seat, and installing emergency alarms (Lord, Sherrington, & Menz, 2001; Nikolaus & Bach, 2003).

Previous findings support that environmental conditions help the visually handicapped navigate their surroundings (Kametani, Kishigami, & Chibana, 2006; Motlagh et al., 2009; Hwang, 2011). The findings suggested that smaller spaces and right-angle corners are less difficult for the vision impaired to recognize (Kametani et al., 2006) and tactile maps, handrails, and door signs contribute to reduced travel time (Hwang, 2011).

2.2 Quality of Life in the Elderly Population

Quality of life is a multidimensional phenomenon encompassing physical, mental, and social functioning and well-being (Hays et al., 1993; WHOQOL Group, 1993; Walker, 2005). In the application of the concept of quality of life, the subjective dimensions often dominate in the most research. However a broader and more complex definition including objective as well as subjective dimensions is recommendable (Birren et al., 1991). Subjective methods based on self-perceptions are self-rated health, life satisfaction, self-esteem, and well-being. Objective methods based on functional assessment include physical heath, functional ability, cognitive capacity, economic status, environmental factors, and etc.

Housing is one of the micro definition (individual, subjective) of quality of life (Bowling, 2004). Quality of life model includes ecological and neighborhood resources such as quality of housing and service, satisfaction with residence, local amenities and public transportation, perceptions of neighborliness and personal safety (Bowling, 2004; Walker, 2005). Walker (2005) addressed the importance of environment' (at all levels) to be considered as a key component of quality of life for aging people. Environmental factors are vital for a comprehensive understanding of quality of life in elderly people (Lundgren-Lindquist & Jette, 1990; Campbell et al., 1994). According to a study done by Iwarsson & Isacsson (1997), objective housing accessibility was related to quality of life in the elderly population. Subjective well-being of the elderly was strongly negatively correlated inaccessible housing that represents a potential health problem, since it threatens the independence.

3. METHOD

To investigate housing conditions, state of housing adjustment or modifications, and the effects of housing conditions on the wellness of the elderly in Korea, we conducted surveys and site evaluation. Questionnaires were collected from 65 visually impaired participants aged over 55. Housing conditions were investigated for 18 houses of participant households.

We developed a structured questionnaire and checklist through the literature review to explore how housing conditions and physical environment influence on the wellness of the elderly with vision impaired. We compared several regulations and guidelines developed from UK, Korea, and USA[2] and extracted some of fundamental features from the collective features, and numerated them by approaches, entrances, doorways, interior rooms, and etc. Through site evaluation, we investigated housing conditions for the vision impaired, state of housing adjustment or modifications, specific housing needs and their requirements.

Participants are initially selected according to the range of circumstances such as housing type, type of vision impaired, and household characteristics. Participants agreed to voluntarily participate in this study. Housing type was categorized into two types: single/multifamily housing and apartment. Type of vision impaired is classified into low vision and blind. Household characteristics are characterized by number of household (living alone, living with one or more people) and housing ownership (own/leased).

A qualitative approach using semi-structured individual interviews on the basis of face to face. Site evaluation was used to investigate housing needs of people with visual impairment. The interview comprised a set of open-ended questions what housing problems participants describe are, what kinds of home modifications had been made, and when injuries of falls or accidents occur. We also obtained permission from the participants to illustrate their living space through drawings and photographs.

In order to investigate the effects of housing conditions, both home hazards and neighborhood hazards are measured (see Table 3). These items refer to basic living conditions noted in past research (Lawton, 1983; Byrnes, Lichtenberg, & Lysack, 2006). The home hazards variables include common housing issues such as the presence of garbage or problem of trash removal, insects or rodents, excessive noise, and in adequate heating or cooling. Neighborhood hazards describe the physical characteristics of neighborhood including crime as a problem, abandoned buildings, streets and sidewalks needing repair, rundown houses/apartments, lack of nearby stores/shopping, and public transportation. Housing condition items were measured on a five-point scale (1= strongly disagree; 5= strongly agree).

According to the degree of difficulties in housing and health condition, respondents were divided into two groups named as HED (high environmental demand) and LED (low environmental demand) using environmental demand items (including

[2] Housing for People with Sight Loss Good Practice Guide (UK), Building Regulation (UK), Fair Housing Act (USA), American Disability Act (USA), Korea Disabled people's Development Institute People with Sight Loss Guideline (Korea), Barrier-free living environment certification Manual (Korea).

environmental risk, and difficulties in housing). In addition the groups has been divided as health condition, good and not good using self-reported items; how they perceive their health condition. Functions of daily life of vision impaired were measured by Self-efficacy Scale. Self-efficacy is the extent or strength of one's belief in one's own ability to complete tasks and reach goals (Ormrod, 2006). For measuring self-efficacy, 17 items were used with the following questions such as "When I make plans, I am certain I make them work. were asked," "One of my problem is that I cannot get down to work when I should," "If something looks too complicated, I will not even bother to try it," and " I feel insecure about my ability to do things". Quality of life refers to the degree of which respondents are satisfied with their life. To access a person's perceived quality of life, personal appraisal, typically asking people how satisfied they are with the various aspects of their life, are used. Quality of life item was measured on a five-point scale (1= strongly unsatisfied; 5= strongly satisfied).

4. RESULT

4.1 General Characteristics of Participants

The general characteristics of participants are shown in Table 1. Of the total 65 respondents, 39 respondents (60.0%) were female, and half of the respondents were in their 60s. Regarding types of vision impaired, 42 respondents (64.6%) were blind and 23 respondents (35.4%) had low vision. For coresidence, 23 respondents (35.4%) lived alone and 42 respondents (64.6%) lived with one or more family members. Regarding housing type, 45.3% of respondents lived in an apartment, 54.7% lived in either single or multi-family housing. For home ownership, 47.6% of respondents lived their own housing, and rest of respondents lived leased housing. Regarding health condition, most of respondents perceived that they are not healthy (mean = 2.35). In terms of quality of life, overall satisfaction was over neutral (mean= 3.11).

4.2 Housing conditions: Home Hazards, Accidents, and Falls Experiences

1) Approaches

Some participants slipped on the stairs and fell down some stairs at the approaching entrance because there were no handrails and no tactile warnings at the beginning and the end of stairs. People with vision impaired are able to move around and walk outside freely. However, some are very reluctant to do so even though they received walking training because they have fears resulted from experiences of falls and accidents. Sudden level differences in pathway and blocking trees should be removed from the main pathway and provide a clear width for path. Some residents stacked objects out of their entrance door. Those items would be obstacles or hazards in the inside corridor or hallway. Mailbox installed was projecting from the wall.

2) Level differences in living areas

In most cases, the level of a main entrance area is lower than that of living area. In bathroom and balcony, Korean used to use water for cleaning. So the level of bathroom and balcony is lower than that of living area in general. With thresholds, level differences cause accidents and falls. In a bathroom, some participants experienced falls because of floor level difference, a sharp slope for drainage or slippery bath floor surface.

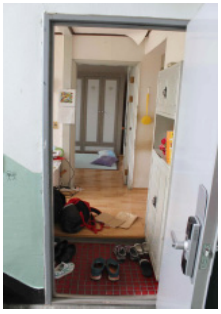
Table 1. General Characteristics of Respondents

Variable		f	%
Sex	Male	26	40
	Female	39	60
	Total	65	100
Age Group	50's	17	26.2
	60's	34	52.3
	70's	14	21.5
	Total	65	100
Types of Vision Impaired	Blindness	42	64.6
	Low Vision	23	35.4
	Total	65	100.0
Family Co-residence	Living Alone	23	35.4
	Living with One or More Family Members	42	64.6
	Total	65	100.0
Housing Type	Apartment	29	45.3
	Single /Multifamily Housing	36	54.7
	Total	65	100.0
Housing Ownership	Own	30	47.6
	Leased	35	52.4
	Total	65	100.0
Health Condition	Very Bad	12	18.5
	Bad	25	38.5
	Neutral	22	33.8
	Good	5	7.7
	Very Good	1	1.5
	Total	65	100.0
Quality of Life	Very Unsatisfied	3	4.6
	Unsatisfied	9	13.8
	Neutral	35	53.8
	Satisfied	14	21.5
	Very Satisfied	4	6.2
	Total	65	100.0

Table 2. Approaches

1-a) Steps without handrails and tactile warnings

1-b) Stacked items in corridors

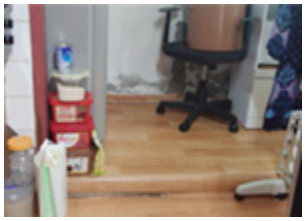


1-c) Level differences in approaches

1-d) Mail box in a lobby

Table 3. Level differences in living areas

2-a) Entrance-living area



2-b) In the kitchen

2-c) Living area- bath/toilet

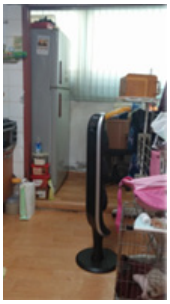
2-d) Living area- balcony

3) Confined space and lack of storages

In the case of public rental housing (including multifamily house and permanently leased apartment), the total area of housing unit is limited so that people have difficulties in moving around in their homes. Furthermore, structural modification is not allowed, they could not install built in furniture. Even small or standard size furniture could be hindrance. Because storage units are very insufficient, living items are distributed in circulation areas and living areas, those items could be hindrance and possible hazardous factors.

Table 4. Confined space and lack of storages

3-a) Little space to move around easily



3-b) Living items distributed in living areas

3-c) Living items distributed in circulation areas

3-d) Insufficient storage

4) Furnishing

Participants have been bruised their faces and legs frequently by banging swing doors from wardrobe and kitchen cabinets. Especially in confined space, when other family member opened doors and left, people hardly recognized the door opened and eventually banged.

People slip over on bathroom. The bath tub was rarely used. People prefer a shower booth or clear space for shower instead of installation of bath tub. Color of sanitary and toilet does not contrast against wall so people with low vision cannot discern the position of sanitary and toilet.

Color of cupboards does not contrast from floors, surfaces and walls so people with low vision cannot discern the position of cupboard. It is necessary to change color of cupboard door to contrast with their background. Door handle that does not contrast with the door is hard to see and grip. Some electrical sockets do not placed suitably for all equipment to be used without trailing wires so participants experienced tripping and falling due to cords or clutter. Swing door of wardrobe and sliding door between bedroom and kitchen cause obstructions and could be possible hazardous factors. Sharp edges of furniture items could be dangerous especially in confined space.

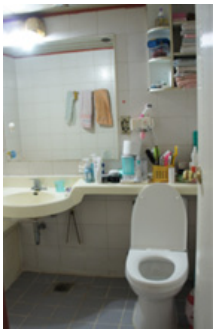
5) Lightings

All participants with low vision mentioned their sensitivity to glare. Traditional overhead ceiling lights with inadequate shielding of the lighting source trigger a high incidence of glare. Some people addressed that too much makes them uncomfortable and too little light unable them to discern objects easily. Lighting was not at an appropriate level and there was no additional task lighting at the sink and above work areas in the kitchen. Additional task lightings and lighting dimmer need to be installed.

Table 5. Furnishing

4-a) Open kitchen cabinet door

4-b) Half-open door



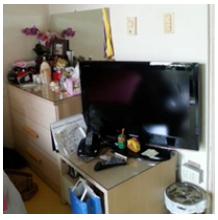
4-c) Color of sanitary and toilet

4-d) Color of Kitchen Cabinet

4-e) Slippery bathroom floor

4-f) Cords

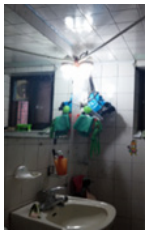
4-g) Door handle



4-h) Sharp edges

Table 6. Lighting

5-a) Shielding of the lighting source



5-b) Inadequate lighting level

4.3 Home Modification

Modifying the home for people with vision impaired focuses on reducing safety hazard. The status of home modification is shown in Table 7. Of the total 18 participants to take part in site evaluation, 14 participants had made physical alterations or adaptations to their homes. Dwellers of rental housing made fewer modifications to their homes and they tend to adapt themselves to their residential environment. Some people altered layout of furniture, color of door frames, location of switches and outlets, lighting fixtures and installed grab bars and cushioned taping for buffering.

Table 7. Home modification

Variables	f	%
Refurbishment	1	7.1
Removing bathtub	1	7.1
Washbasin faucet replacement	2	14.4
Toilet replacement	1	7.1
Shower repair	1	7.1
Waterproofing	1	7.1
Boiler Repair	3	21.5
Wall papering	2	14.4
Install screens	1	7.1
Replacing light fixture	1	7.1
Total	14	100.0

Table 8. Examples of Home Modification

6-a) Installation of outlets

6-b) Installed grab bars

6-c) Cushioned taping for buffering

6-d) Colored door frames

To prevent collision, one participant attached a toy on a clear sliding glass window for indication of closure. The furniture was placed against the wall to clear pathways for safe mobility from one room to another.

They used social home improvement service for the vision impaired such as replacing fluorescent bulbs, installing electrical

outlet, and installing grab bar at the bathroom. However, people living in rented housing expressed difficulties in adjustment or modification because they are not allowed to do so. People enumerated some desired changes and improvements, for instance, sliding doors instead of swing doors, replacement of inappropriate built in furniture, lay out of rooms, more spacious entrance, sufficient storage areas, rounded corners of door frames, unslippery floors, accessible controllers for heating, installation of shower area instead of poorly designed bath tub, and etc.

4.4 Effects of Housing Condition on Wellness

Housing conditions are measured through home hazards and neighborhood hazards (Table 9). For home hazard, "Inadequate Cooling and Heating" was the most unsatisfactory factor (mean=3.52), followed by "Excessive Noise", and "General Housing Satisfaction". For neighborhood hazard, "Rundown Houses/Apartments" was the most unacceptable item (mean=3.06), followed by "Streets and Sidewalks Needing Repair", and "Neighborhood Safety".

Table 9. Housing conditions

Variables		Mean	St. Dev.
Home Hazard	General Housing Satisfaction	2.71	1.057
	Presence of Garbage or Problem of Trash Removal	2.62	1.343
	Problem of Insect or Rodents	2.66	1.428
	Inadequate Toilet Facilities	2.41	1.508
	Inadequate Cooling and Heating	2.48	1.324
	Excessive Noise	2.78	1.505
Neighborhood Hazard	Neighborhood Safety	2.94	1.116
	Crime as a Problem,	2.54	1.426
	Streets and Sidewalks Needing Repair	3.02	1.386
	Rundown Houses/Apartments	3.06	1.488
	Lack of Nearby Stores/Shopping	2.12	1.329
	Public Transportation Being Too Far Away	2.71	1.465
	General Neighborhood Satisfaction	2.98	1.097

1: satisfactory, 5: unsatisfactory

Table 10. Means, standard deviations and correlations between the variables

Variables	Mean	St. Dev.	1	2	3	4
1:Neighborhood Hazards	2.77	.797				
2: Home Hazards	2.62	.843	.660**			
3:Experience of Accidents	.49	.504	.123	.249*		
4:Self-efficacy	3.46	.495	.040	-.016	-.113	
5: Quality of Life	3.11	.886	-.163	-.285*	-.296*	.334**

*: p<0.05, **: 0<0.01

Means, standard deviations and correlations between the variables measured are shown in Table 10. This table indicates that home hazards was significantly positively correlated with experience of accidents (r=0.249, p<0.05) and was significantly negatively correlated with quality of life (r=-0.285, p<0.05). Experience of accidents was significantly negatively correlated with quality of life (r=-0.296, p<0.05) and self-efficacy was significantly positively correlated with quality of life (r=0.334, p<0.01).

When individual health condition is good and environmental demand is low, the mean score of life satisfaction is the highest (Figure 1). Life satisfaction of four groups did not differ significantly (F=0.523, p>0.10). For perceived self-efficacy, people with good health condition rated their self-efficacy higher (Figure 2). ANOVA confirmed a significant group difference in self-efficacy (F=3.045, p<0.05). Post hoc comparisons indicated that people with good health condition had higher self-efficacy regardless of environmental demand. In case of people with bad health condition, those who were in low environmental demand group showed higher self-efficacy than those who were in high environmental demand group. The result indicated that when people ae more fragile and worse health condition, the effects of environment condition would be more influential.

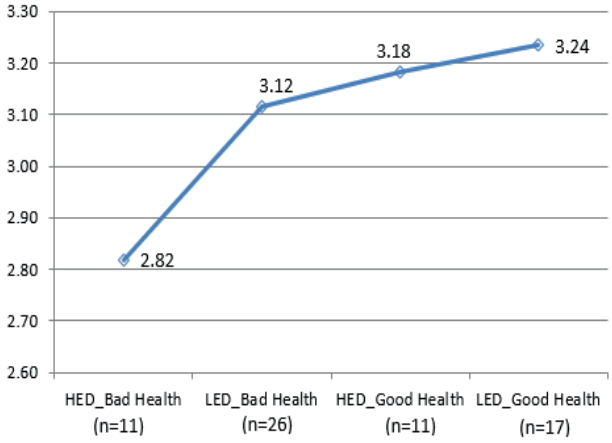


Figure 1. Quality of life according to environmental demand and health condition

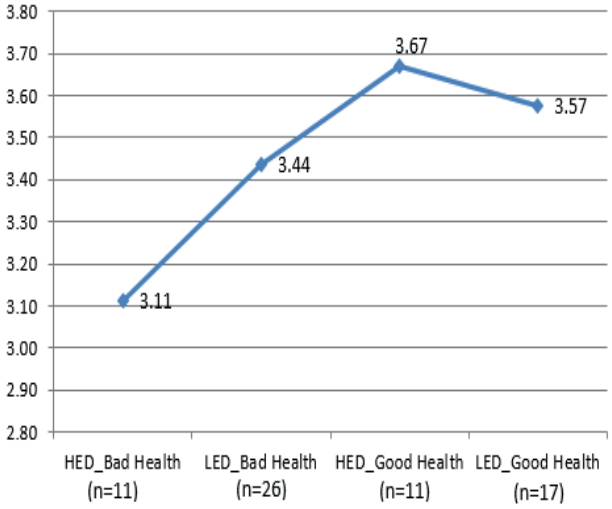


Figure 2. Perceived self-efficacy according to environmental demand and health condition

When individual health condition is good and environmental demand is low, the mean score of life satisfaction is the highest (Figure 1). Life satisfaction of four groups did not differ significantly ($F=0.523$, $p>0.10$). For perceived self-efficacy, people with good health condition rated their self-efficacy higher (Figure 2). ANOVA confirmed a significant group difference in self-efficacy ($F=3.045$, $p<0.05$). Post hoc comparisons indicated that people with good health condition had higher self-efficacy regardless of environmental demand. In case of people with bad health condition, those who were in low environmental demand group showed higher self-efficacy than those who were in high environmental demand group. The result indicated that when people ae more fragile and worse health condition, the effects of environment condition would be more influential.

5. CONCLUSION

The purpose of this study is to investigate housing conditions for the elderly with vision impaired, state of housing adjustment or modifications, and the effects of housing conditions on the wellness of the elderly in Korea. Housing conditions of those participated in this study were poor in general. When participants moved to their new residence, they frequently experienced minor accidents due to the obstacles, furniture, swing doors and layouts until they had accustomed to the new environment. People have little information regarding housing condition and difficulties in addressing their particular needs. It is necessary to provide more relevant information regarding housing and housing condition when the people with impaired vision decide their residence.

Most observed home hazards are level differences in living areas, obstacles in the hallway, confined space, swing doors from wardrobe or cabinets, color contrast, poor lightings, and etc. Many of those features are not allowed to do structural modification. As a result, few modification or refurbishment was made and participant tends to adapt themselves to their residential environments.

Older adults living in better housing condition and under less difficult environments are likely to have higher life satisfaction. The effects of housing condition on wellness could be more influential when individual capabilities are weaker. The findings underline that with intervention of individual characteristics, the effects of housing and physical environment would get ameliorated or reduced.

Previous findings highlighted challenges to people with sight loss for adaptation and modification because 'there is no uniform disabled person' (Percival et al., 2006). Petch (2007) addressed importance of individual choice which can be whether they opt for a mainstream housing option or for some form of specialist provision since approximately 70% of visually impaired people were in rented provision compared to 30% in the rest of the population.

Statistical analysis fail to support positive effect of housing condition on satisfaction of people with sight loss in this paper. The effects of housing condition on perceived self-efficacy are also not clear. This may be due to lack of number of samples or lack of extreme housing condition. However, the higher scores in life satisfaction for lower environmental demand group than higher environmental demand group appeared consistently when they perceive them as not good. The effects of housing condition on wellness could be more influential when individual capabilities are weaker for instance individual under a bad health condition.

Despite of some of limitations, this paper would contribute to extend knowledge of the basic and fundamental needs of people with sight loss in their housing as well as to suggest important roles of housing in people's life satisfaction and wellness. This paper presented the findings for research inquiry and development of housing guidelines for the people with vision impaired in Korea. Although there are some useful design guidelines for the blind in global standards, due to the specific housing settings and living culture, we need to provide more suitable guidelines for the people with vision impaired in Korea. For the development of a checklist and guidelines, it is necessary to develop more inclusive and universal guidelines since many people with sight loss live in a rented housing, it is more difficult for them to adapt to or modify their housing.

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