The effect of the housing support policy for the disabled and factors affecting policy satisfaction in South Korea

Hee Bum Lee

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Martin School of Public Policy and Administration

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Advisor: J. S. Butler, PhD

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Abstract

The Korean government has recently recognized the importance of residential environment for the disabled, and has begun to establish various housing support policies as a social safety net. In this context, the Korean government has enacted the Housing Support Act for the Underprivileged (HSAU) which includes the disabled in 2012. The goal of this legislative action is to strengthen the Housing Support Policy for the Disabled (HSPD) and establish a legal basis for HSPD (NLIC, 2017). The purpose of this study is to analyze whether the introduction of HSAU has a positive effect on the policy satisfaction for the disabled. This study also identifies the main factors that affect the policy satisfaction for the disabled in terms of the policy determinants. For this, a Multiple Linear Regression Analysis (MLRA) was used to estimate the factors affecting policy satisfaction.

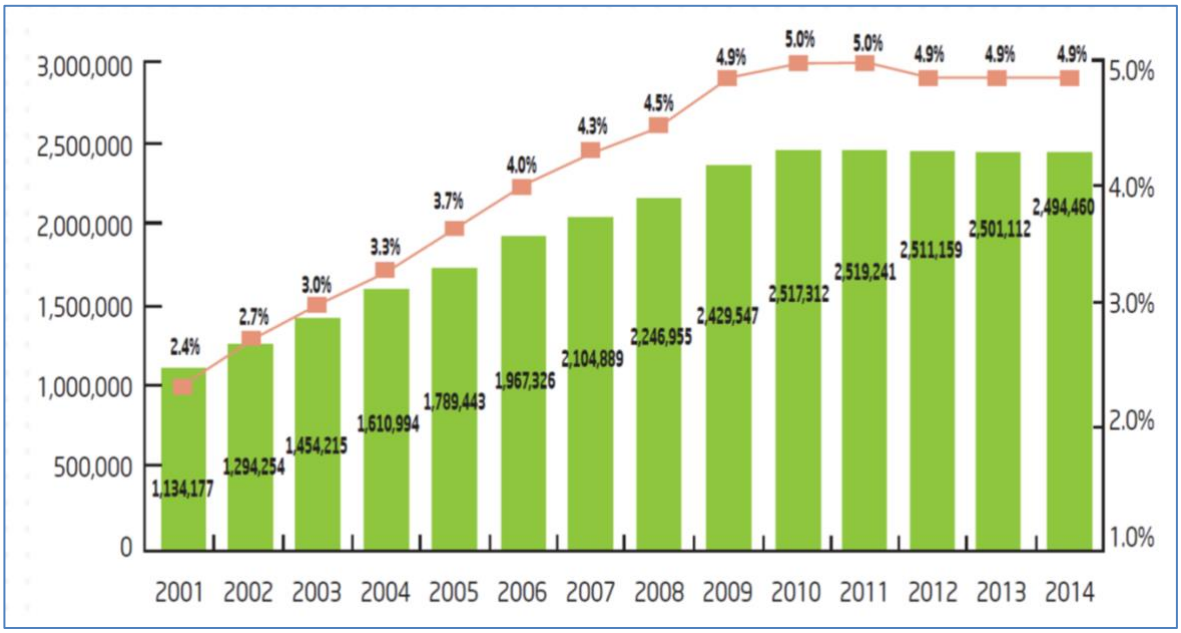
The data used for the analysis are the Housing Survey for the Disabled (HSD) which were conducted in 2009 and 2015 led by the Ministry of Land, Infrastructure and Transport (MOLIT). This study concluded that the policy satisfaction and quality of life of the beneficiaries increased more than the non-beneficiaries after the introduction of HSAU, indicating that the government's housing support policy for the disabled has a policy effect due to the introduction of HSAU. The study also confirmed that the residential satisfaction and the quality of life had a significant effect on the policy satisfaction.

In addition, this study showed that the accessibility of major facilities such as social welfare institutions, and social environment factors including sanitary conditions and pollution are more influential on residential satisfaction than other factors. The health status, economic status, and social relations were also statistically significant regarding the perception of quality of life. In conclusion, the Housing Support Policy for the Disabled (HSPD) implemented by the government has a policy effect.

Introduction

According to the Korea Employment Agency for the Disabled (KEAD), the number of people with disabilities in Korea reached about 2.5 million in 2014, which is about 5% of the total population, 50 million (Figure 1). In addition, 52% of disabled persons are over 60 years old, which is a much larger proportion than the 15% of the total population (KEAD, 2015). Therefore, a variety of policy support for the disabled, including the elderly, is needed in terms of a social safety net.

Figure 1) Registered disabled persons

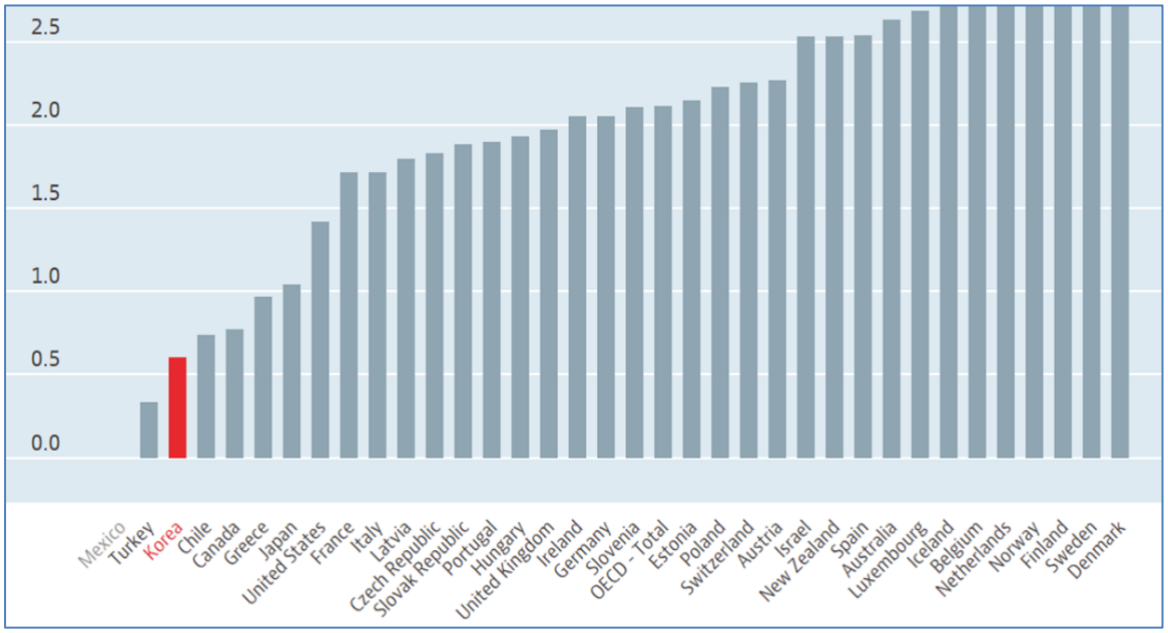


Source: Registered Disabled People (Health and Welfare Department (HWD), 2015)

On the other hand, Korea's public spending on incapacity[1] is also only 0.6% of GDP in 2013, the 33rd lowest among the 35 OECD countries (Figure 2), while GDP is the 23rd of the 35 countries. This suggests a policy change where the Korean government should have more aggressive fiscal policies to invest in the infrastructure for the disabled.

[1] According to OECD, "Public spending on incapacity" refers to public sector spending due to disability, illness or occupational injury. This indicator is measured in percentage of GDP.

Figure 2) Public spending on incapacity



Source: The Organization for Economic Co-operation and Development (OECD) data in 2013

In this situation, the Korean government has recently recognized the importance of residential housing for the disabled, and has begun to establish various of housing support policies to improve their residential environment for the disabled. The HSPD currently implemented by the government is divided into four categories according to the policy support contents (Kang, 2010). The first is the housing supply policy for the disabled, the second is the housing expense policy[2], the third is the housing financing policy and the last is a housing renovation policy (Table 1).

HSPD can also be classified into three types of agencies according to the operator of the HSPD (Kang, 2010): the central government, local governments, and private organizations including NGOs. Looking at the HSPD in detail, housing policies include providing information, offering low-interest loans, subsidizing housing renovation, the

[2] The housing expense policy, which was reflected only in the 2009 Housing Survey for the Disabled (HSD), was excluded from this study.

establishment of support facilities for the disabled and occupancy priorities which favor those individuals with disabilities in obtaining housing. The occupancy priorities are the most common policies of HSPD.

Table 1) Housing Support Policies[3] for the Disabled (HSPD)

HSPD	Current policy content	Caterory	The legislation of HSAU (2012)
HSPD 1	Housing purchase loan with low interest	Financing	
HSPD 2	Rental housing loan with low interest	Financing	
HSPD 3	**Housing renovation subsidies**	**Renovation**	**Article 15**
HSPD 4	**Occupancy priority of permanent public rental housing**	**Supply**	**Article 10**
HSPD 5	**Occupancy priority of long-term public rental housing**	**Supply**	**Article 10**
HSPD 6	**Occupancy priority of Shift public retal housing**	**Supply**	**Article 10**
HSPD 7	Occupancy priority of multu-household purchased rental h	Supply	
HSPD 8	Occupancy priority of existing rental housing	Supply	
HSPD 9	Occupancy priority for the disabled with low income	Supply	
HSPD 10	Occupancy priority of general public housing	Supply	
HSPD 11	**Installation of preferred facilities for the disabled**	**Supply**	**Article 9**
HSPD 12	Providing general information of HSPD	-	

Source: Housing Survey for the Disabled (HSD) and National Law Information Center (NLIC)

In 2012, the Korean government enacted the Housing Support Act for the Underprivileged (HSAU) including the disabled. The purpose of this law is to strengthen and improve the current housing support policy of the disabled by ensuring legal binding through legislation (NLIC, 2017).

[3] Prior to the introduction of HSAU, HSPD was conducted mainly through the self-regulation of the executive agency or interpretation of other laws.

Table 2) Housing Support Act for the Underprivileged (HSAU)

HSAU	Main contents
Article 2	The disabled were included in the definition of the underprivileged disabled such as elderly and veterans
Article 7	To conduct Housing Survey for the underprivileged every two years
Article 9	Mandatory installation of support facilities for the underprivileged
Article 10	Mandatory supply of public rental housing for the underprivileged
Article 15	Support for home renovations for the underprivileged

Source: National Law Information Center (NLIC), http://www.law.go.kr

As shown in Table 1, five housing support policies have become legally binding under HSAU, mainly related to the mandatory supply of public rental housing for the disabled. As a result, a stable legal basis for the housing support policy for the disabled has been established through the introduction of the HSAU.

Despite these policy efforts, in September of 2017, parents of students with disabilities in South Korea kneeled and apologized to residents who opposed the construction of a school for the disabled asking for their objection to being withdrawn at a public hearing (Kookmin, 2017). This case shows that Korean society is still caught up in misperception and negative prejudice against people with disabilities. To solve this problem, voluntary participation and efforts from various social classes should be actively implemented by the government and the local community to form the correct perception and social consideration for the disabled in the long term.

Literature review

1) Theories of residential satisfaction and disability

This study defined residential satisfaction as a measure of policy satisfaction. Therefore, it is necessary to examine the theoretical background about the residential

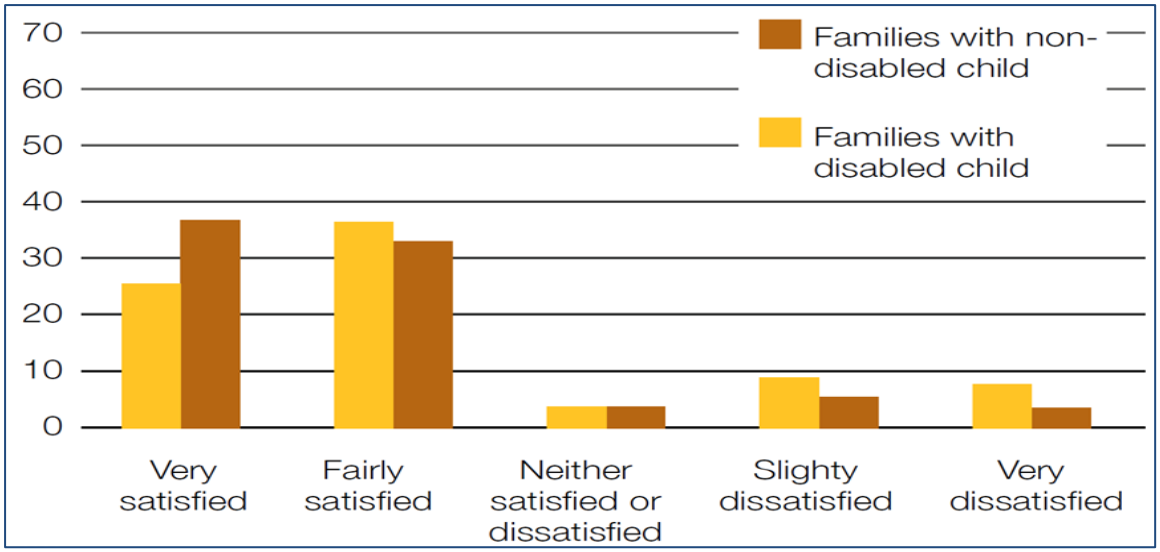
satisfaction. This study explains policy determinants by analyzing residential satisfaction which is a crucial factor in policy development (Lu, 1999). Various theories on residential satisfaction related to housing policy have been studied. According to Mohit (2010), public institutions should focus on housing supply and public facilities because they have a positive impact on the residential satisfaction of low-income households. Lu (1999) argued many factors influencing residential satisfaction are essential criteria for the development of housing policy. There is also a case showing the correlation between ownership and residential satisfaction: "homeownership has a stronger correlation with residential satisfaction than renting in most southern European countries", (Elsinga & Hoekstra, 2005). In another study by Tsemberis (2012), it shows that consumer-oriented housing support programs, which have high accessibility and fast policy effectiveness, might generate strong policy effects for the policy target: "chronic homeless and severely disabled".

With disability, there are several studies emphasizing social issues of the disabled. According to Beresford (2008), the problem of children with disabilities is emerging as a social policy issue. In his study of disabled children, he found that families with disabled children had less residential satisfaction than those without disabled children (Figure 3). It also shows that additional housing space for a child with a disability was needed because of their physical incapacity. In Beresford's study, the psychological stress of parents was also increased. These findings can be the theoretical basis for establishing a housing support policy for the disabled considering unique characteristics of families with disabilities.

Besides, social adaptation of persons with disabilities is a crucial factor in the policy goal of supporting independence (Bob, 1995). Not only the disabled person but also the family members who support them play a significant role in policy development for the disabled. (Sloper, 1999). According to Borsay (1986), disability is not a problem that

individual members need to deal with, but the whole society needs to pay attention and cope with it. Environmental changes such as home renovations for people with disabilities also have a significant impact on the degree of self-reliance of persons with disabilities about the "Independent Living (IL) paradigm[4]" (Dunn, 1990).

Figure 3) Housing satisfaction of families with a disabled child



Source: "Housing and disabled children" (Beresford, 2008)

2) The measurement of residential and policy satisfaction

The Multiple Linear Regression Analysis (MLRA) is a useful tool for analyzing critical factors on residential satisfaction (Perez, 2001). Regression analysis shows that education, employment, age and other variables have an impact on the residential satisfaction (Ibem & Amole, 2013). Regression analysis was also used to measure the residential satisfaction of low-income families (Bruin & Cook, 1997). Income levels in public housing have a significant impact on residential satisfaction (Varady & Carrozza, 2000). Housing

[4] The IL paradigm analyzes the causes of disability problems and suggests alternatives for solving them. This focuses on the unnecessary dependence of people with disabilities (Dunn, 1990).

types also predict residential satisfaction (Milburn & Gary, 1990). Another recent article that has conducted MLRA by setting age, gender, health status, and financial burden as control variables, and shows that geographical differences and household income affect residential satisfaction (Fernández-Carro, Módenes, & Spijker, 2015). Also, interpersonal relationships are included among the factors affecting the residential satisfaction (Prieto-Flores et al. 2011).

Several previous studies have used residential satisfaction as a dependent variable to measure policy effects such as public rental housing policy (Choi and Lee, 2015). In Hwang's study, the public's satisfaction with the performance of Korean public institutions was measured through a regression (Hwang, 2005). MLRA is a widely used statistical method for measuring the policy effect of rental housing in South Korea, (Kang & Yu, 2014; Kwon & Ko, 2010; Sul & Chae, 2013). We can confirm some facts through previous studies. First, residential satisfaction and policy satisfaction were used as dependent variables to measure policy effects. Second, social and economic factors as well as physical factors affected residential satisfaction. Third, policy support is needed to improve residential satisfaction for various policy beneficiaries. Finally, there are not many cases where policy satisfaction is applied to measure policy effects. Therefore, if we directly measure the policy effect through the policy satisfaction, it can provide meaningful information concerning policy effectiveness.

Methodology

1) Data and measures

The objective of this analysis is to measure the direct effect of the housing support policy for the disabled according to the introduction of the HSAU. In this study, the overall policy satisfaction of policy beneficiaries was defined as a dependent variable. The policy satisfaction, dependent variable, is measured on a four-point Likert scale. This study analyzes whether there is an measurable improvement on policy satisfaction after introducing a related

legislative action. This study also explains what the cause of the improvement effect is if it shows that the policy satisfaction has increased since the adoption of associated laws (HSAU).

The Housing Survey measuring the policy and residential satisfaction changes depending on the types of households (with or without disability). Because the Housing Support Act for the Underprivileged was enacted in 2012, this analysis was focused on the Housing Surveys for the Disabled (HSD) conducted in 2009 and 2015 to be consistent with the research purpose. In addition, data from the disabled living in medical facilities were excluded to narrow the policy targets to ones living in residential facilities, which is the primary policy target of the housing support policy.

This study is based on the housing survey conducted by the Ministry of Land, Infrastructure and Transport (MOLIT) in 2009 and 2015. Since 2006, housing surveys have been carried out annually, divided into general surveys and policy surveys. The Housing Survey for the Disabled (HSD) was conducted twice, once in 2009 and once in 2015. This survey is aimed at the households that include the disabled registered in the database of the Ministry of Health and Welfare as household head or household member (KRIHS, 2015).

Table 3) Housing Survey for the Disabled (HSD)

Survey Name	"Policy Survey in 2009 and 2015: Persons with Disabilities"
Observation[5]	Target sample of 9,676 in 2009 and 8,004 households in 2015
Main variables	Age, Family number, Education, Income, Housing Type, Employment, Recognition of the policy, Experience of the policy
	Policy satisfaction, Residential satisfaction, Quality of life

Source: 2009, 2015 Housing Survey for the Disabled (HSD) conducted by MOLIT & KRIHS

[5] Survey respondents with disabilities who are listed on the Register of Disabled Persons of the Ministry of Health and Welfare (MHW) or Households with disabilities nationwide in 2009 and 2015

The purpose of the survey is to help the government establish a housing policy that meets the attributes of various classes based on the survey results (KRIHS, 2015).

The housing survey is divided into household questionnaires and individual questionnaires for the disabled individual. Table 3 shows the main contents of the survey. Among the many variables, policy experience of housing support policy, overall residential satisfaction, quality of life and the policy satisfaction can be used as data to measure changes in perception of the beneficiaries according to HSPD (Choi and Lee, 2015).

2) Analysis model

This study investigates whether there is a policy effect for beneficiaries of housing support policy for the disabled. If the policy effect appears after the enactment of relevant legislation, this study then analyzes the cause. This analysis is widely used to compare the policy effects of the policy beneficiary (treatment groups) and the non-beneficiary (control groups) at a certain point in time. In other words, a control group and a treatment group are defined, and the difference in policy effects between two groups is compared before and after the introduction of HSAU through descriptive statistics (Choi and Lee, 2015).

$$\boldsymbol{Policy\ satisfac_i} = \boldsymbol{\alpha_i} + \boldsymbol{\beta_1 Benef_i} + \boldsymbol{\beta_2 Residen_i} + \boldsymbol{\beta_3 Quality_i} + \boldsymbol{\beta_4 X_i} + \boldsymbol{\varepsilon_i} \text{ (}i\text{= entity)}$$

In this equation, $Benef\cdot$ is the group dummy variable (policy beneficiary group = 1, policy non-beneficiary group = 0), $Residen_i$ is the scale of residential satisfaction for the respondents. $Quality_i$ represents the perception of quality of life for both groups. $\cdot\cdot$ denotes the control variables, and ε_i represents the random error term. The coefficients of these models can be derived through Multiple Linear Regression Analysis (MLRA).

In general, the assumption of this study is that the individuals belonging to the two groups should be randomly selected relative to housing satisfaction. Otherwise, there may be a selection bias problem, in which the analysis results are distorted due to differences in

characteristics between both groups correlated with policy satisfaction. The study was limited to persons with disabilities who were living in residential facilities, except for disabled persons in a medical facility (81 facilities) to set as a control group with similar characteristics to the treatment group. The reason for this is that the sample heterogeneity between the control group and the treatment group can be increased if the disabled in medical facilities (not the main targets of the policy) are included in the control group. Housing survey data from the two datasets (2009 and 2015) were selected to identify changes in policy satisfaction. Therefore, 2009 data (9,676 with disabilities in residential facilities) and 2015 data (8,004 with disabilities in residential facilities) were merged.

Various criteria are applied to distinguish between control and treatment groups in order to minimize selection bias. In one study, the policy beneficiary group and the non-beneficiary group are classified according to the recognition of the policy (Kim, 2011). Thus, the heterogeneity of the sample may appear between the control and treatment group if the treatment group is simply designed as a policy beneficiary. (Kim, 2011). HSD has selected households with disabilities nationwide by region, class and so on so that there are many differences according to a residential area, income class, and other factors. In this study, the beneficiaries of the policies[6] (1,788), which were directly affected by the introduction of HSU among all the beneficiaries[7] (2,220) of the HSPD, were designed as treatment groups and the beneficiaries of the remaining policies were set as control groups (432).

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[6] Five policies have become legally binding in the three main contents of the HSAU: 1) Support for housing renovation expense 2) Public rental housing priority 3) Installation of support facilities for the disabled.

[7] These policies were designed as beneficiary among the respondents once they became policy beneficiary by one or more of the policy of all housing support policies.

3) Variables

This study examines the policy effect on the beneficiaries of the HSPD, setting policy satisfaction as the dependent variables. The purpose of HSAU[8] is to stabilize the residential level of vulnerable groups such as the disabled and the elderly. The effect of this enactment is to improve the quality of housing support policy for the disabled in terms of policy satisfaction. Therefore, this study intends to analyze the policy effect on policy satisfaction by the enactment of HSAU. The dependent variable was measured in response to the "policy satisfaction" for each policy presented in the housing survey. This variable was evaluated on a scale from 1 to 4, with 4 being the highest satisfaction. To measure effective policy satisfaction, the policy satisfaction was redesigned by summing the satisfaction of each policy.

Next, the beneficiary dummy variable was used to measure the policy effect depending on whether they are beneficiaries (treatment group) of the policy or not (control group). The quality of life and the residential satisfaction were used as explanatory variables to examine the causal relationship as the major factors influencing the policy satisfaction. The control variables are individual or household properties that can affect the residential satisfaction in previous research. These control variables were age, education, income, family number, housing type, employment, residential area.

In addition, several variables were selected to determine what factors affected the residential satisfaction and quality of life. These variables can be classified into physical environmental, economic, and neighboring environmental factors (Hong, 2009). These three factors used were applied in the HSD. For example, physical environmental factors are housing type and residential area. Neighboring environmental factors are accessibility to

[8] National Law Information Center (NLIC), http://www.law.go.kr.

welfare facilities, including parking, such as hospitals, education institutions, shopping centers and cultural facilities while the economic factor is household income.

Table 4) Variables' definition and measurement

Variables			Measurement	
Dependent variable		policy satisfation	sum of each policy satisfaction (Min= 0 ~ Max= 22)	
Control variable		age	age at the time of survey	
		education	elementary= 1, middle= 2, high school= 3, university= 4	
		family number	family number	
		employment	employment = 1, non-employment = 0	
		income	actual income (KRW 10,000)	
		type of house	1 ~ 10: depending on the type of housing	
		residential area	actual residential area(㎡)	
Explanatory variable	predictors	beneficiary	dummy variable	treatment group=1, control group=0
		residential satisfaction	Likert scale	very unsatisfactory= 1 ~ very satisfied= 4
		qality of life	Likert scale	very unsatisfactory= 1 ~ very satisfied= 4
	residential satisfaction	shopping	Likert scale (accessibility)	very unsatisfactory= 1 ~ very satisfied= 4
		medical	Likert scale (accessibility)	very unsatisfactory= 1 ~ very satisfied= 4
		public service	Likert scale (accessibility)	very unsatisfactory= 1 ~ very satisfied= 4
		culture	Likert scale (accessibility)	very unsatisfactory= 1 ~ very satisfied= 4
		welfare	Likert scale (accessibility)	very unsatisfactory= 1 ~ very satisfied= 4
		transportation	Likert scale (accessibility)	very unsatisfactory= 1 ~ very satisfied= 4
		parking	Likert scale (accessibility)	very unsatisfactory= 1 ~ very satisfied= 4
		education condition	Likert scale (accessibility)	very unsatisfactory= 1 ~ very satisfied= 4
		safety from crime	Likert scale	very unsatisfactory= 1 ~ very satisfied= 4
		noise level	Likert scale	very unsatisfactory= 1 ~ very satisfied= 4
		sanitary condition	Likert scale	very unsatisfactory= 1 ~ very satisfied= 4
		pollution level	Likert scale	very unsatisfactory= 1 ~ very satisfied= 4
	quality of life	health	Likert scale	not very good= 1 ~ very good= 4
		economic	Likert scale	not very good= 1 ~ very good= 4
		relation1	Likert scale	not very good= 1 ~ very good= 4
		relation2	Likert scale	not very good= 1 ~ very good= 4

Findings

Table 5) Descriptive statistics on variables

Variables		Control group		Treatment group	
		2009	2015	2009	2015
		Mean (Standard deviation)	Mean (Standard deviation)	Mean (Standard deviation)	Mean (Standard deviation)
Observations		237	195	963	825
Dependent variable	**policy satisfation**	**3.13 (1.50)**	**3.16 (1.22)**	**3.66 (2.01)**	**3.89 (1.86)**
Control variable	age	53.67 (17.73)	52.98 (19.82)	53.63 (16.36)	56.85 (16.35)
	education	2.11 (1.11)	2.36 (1.07)	1.87 (0.99)	2.07 (0.99)
	family number	2.87 (1.29)	2.85 (1.41)	2.39 (1.23)	2.07 (1.09)
	employment	0.25 (0.43)	0.22 (0.41)	0.12 (0.32)	0.18 (0.38)
	income	138.34 (116.93)	178.47 (132.27)	83.64 (60.94)	113.39 (89.25)
	type of house	3.44 (1.71)	3.38 (1.61)	3.88 (0.78)	3.88 (0.92)
	residential area	66.04 (39.52)	72.26 (32.29)	37.42 (19.72)	49.08 (26.34)
Explanatory variable	**residential satisfaction**	**2.89 (0.60)**	**2.84 (0.55)**	**3.05 (0.51)**	**2.95 (0.53)**
	qality of life	**2.22 (0.76)**	**2.30 (0.71)**	**2.10 (0.62)**	**2.29 (0.65)**
Residential variable	shopping	2.71 (0.77)	2.75 (0.73)	2.87 (0.75)	2.81 (0.71)
	medical	2.65 (0.80)	2.69 (0.78)	2.84 (0.74)	2.77(0.73)
	public service	2.78 (0.70)	2.79 (0.69)	2.93 (0.78)	2.83 (0.68)
	culture	2.62 (0.80)	2.79 (0.74)	3.03 (0.69)	2.97 (0.65)
	welfare	2.46 (0.82)	2.64 (0.74)	3.00 (0.76)	2.83 (0.72)
	transportation	2.83 (0.77)	2.80 (0.74)	3.09 (0.68)	2.96 (0.64)
	parking	2.63 (0.84)	2.55 (0.83)	3.04 (0.70)	2.96 (0.65)
	education condition	2.76 (0.70)	2.83 (0.62)	2.95 (0.64)	3.00 (0.58)
	safety	2.97 (0.63)	2.89 (0.55)	3.12 (0.56)	2.98 (0.55)
	noise	2.78 (0.80)	2.87 (0.66)	2.82 (0.73)	2.86 (0.65)
	sanitary	3.02 (0.70)	2.96 (0.53)	3.02 (0.66)	3.01 (0.54)
	pollution	2.99 (0.71)	2.99 (0.51)	3.15 (0.54)	3.05 (0.50)
Quality variable	health	1.93 (0.77)	2.02 (0.68)	1.86 (0.69)	1.97 (0.69)
	economic	1.74 (0.73)	1.89 (0.68)	1.57 (0.59)	1.75 (0.62)
	relation1	2.95 (0.68)	2.90 (0.53)	2.90 (0.59)	2.93 (0.55)
	relation2	2.89 (0.62)	2.84 (0.63)	2.86 (0.55)	2.91 (0.49)

According to the descriptive statistics (Table 5), which shows the mean and standard deviation of each variable for the treatment group and the control group, A total of 1,788 policy beneficiaries, who were directly affected by the introduction of HSAU, were set as a treatment group, and 432 remaining policy beneficiaries not related to HSAUs were divided into control group. In the treatment group, the policy satisfaction increased from 3.66 to 3.89, and the perception of quality of life rose from 2.10 to 2.29. Residential satisfaction decreased slightly from 3.05 to 2.95[9]. Next, in the control group, the policy satisfaction rose slightly from 3.13 to 3.16 and the perception of the quality of life increased from 2.22 to 2.30. The level of residential satisfaction decreased from 2.89 to 2.84.

2) Analysis of improvement effect of policy satisfaction

Table 6) The policy effect on control and treatment group

Policy effect (Mean)	Policy satisfaction			Residential satisfaction			Quality of life		
	2009	2015	Increase	2009	2015	Increase	2009	2015	Increase
Control	3.13	3.16	0.03	2.89	2.84	-0.05	2.22	2.30	0.08
Treatment	**3.66**	**3.89**	**0.23**	**3.05**	**2.95**	**-0.10**	**2.10**	**2.29**	**0.19**
Total	3.55	3.75	0.20	3.02	2.93	-0.09	2.12	2.29	0.17

Table 6 above shows the mean of the main variables in the treatment group and the control group, divided before and after HSAU introduction (2012). The policy satisfaction (3.66 to 3.89) and the perception of quality of life (2.10 to 2.29) for the treatment group were significantly increased after the introduction of HSAU, but the policy satisfaction of the

[9] The average residential satisfaction of total sample (8,004) in 2015 was 2.88, which was lower than the average residential satisfaction of 2.95 (9,676) in 2009, showing a declining trend during this period.

control group was only slightly increased. According to this analysis, the introduction of the HSAU has a positive effect on the policy satisfaction and the perception of the quality of life of the housing support policy for the disabled. Therefore, we analyzed a variety of factors influencing policy satisfaction through Multiple Linear Regression Analysis (MLRA). As shown in Table 7, the MLRA showed that the regression coefficient of the policy beneficiary variable was 0.538, which was statistically significant at a 1% significance level. This coefficient indicates that when other variables are controlled, the policy satisfaction increases by 0.538 on average when they become policy beneficiaries. These results show that the introduction of HSAU has a substantially positive effect on policy satisfaction. Therefore, we analyzed what factors directly affect policy satisfaction.

Table 7) Analysis of factors influencing policy satisfaction

Variables	**Dependent variable: policy satisfaction**		
	Multiple Linear Regression Analysis (MLRA)		
	Coefficient	**Standard error**	**T-stat**
Beneficiary	**0.538**	**0.096**	**5.580*** **
Residential satisfaction	**0.320**	**0.085**	**3.770*** **
Quality of life	**0.242**	**0.077**	**3.100*** **
Age	0.001	0.002	0.460
Education	0.026	0.039	0.660
Family number	-0.030	0.045	-0.670
Employment	**-0.300**	**0.092**	**-3.240*** **
Income	0.000	0.000	-0.330
Type of house	**0.101**	**0.039**	**2.530*** **
Residential area	0.001	0.001	0.920
Constants	1.293	0.454	2.850***
Observation	2,214		
R square	0.041		

*** p<0.01, ** p<0.05, * p<0.1

The key variables affecting the policy satisfaction are as follows: residential satisfaction and quality of life. The regression coefficients of theses explanatory variables are analyzed as 0.320 (P-values: 0 < 0.001) and 0.242 (P-values: 0.002), respectively, which show statistically significant effects at the significance level of 1%. This result suggests that the positive perception of the quality of life of the disabled and the improvement of residential satisfaction have a significant effect on satisfaction with the housing support policy of the disabled. Among the control variables, employment (-) and housing types (+) had a statistically significant effect on policy satisfaction. This implies that securing a more stable occupation rather than a part-time job and more residential space have a positive impact on policy satisfaction. The remaining control variables such as age, education, and family number were not statistically significant.

Demonstrated by Table 8 below, we examined what factors affect residential satisfaction and quality of life. Among the explanatory variables related to accessibility, accessibility to welfare facilities (Coefficient: 0.064, P-values: 0.004) was statistically significant at a 1% significance level on residential satisfaction while accessibility to medical, cultural, and parking facilities was statistically significant at a 5% significance level on residential satisfaction. It can be concluded that the welfare facilities supporting mental and physical disabilities are more likely to affect the residential satisfaction of the disabled than the accessibility of other facilities. Also, social environmental factors such as safety from crime, sanitary condition, the level of noise and pollution were statistically significant at a 1% significance level. This suggests that the residential satisfaction of the disabled is very sensitive not only to physical environmental factors but also to social environmental factors due to economic growth and increased income. The control variables did not have statistically significant effects on residential satisfaction. This result shows that the accessibility of main

facilities and social environmental factors are more influential on residential satisfaction than the individual or household characteristics such as age or family number.

Table 8) Analysis of factors influencing residential satisfaction

Variables	Dependent variable: Residential satisfaction		
	Multiple Linear Regression Analysis (MLRA)		
	Coefficient	Standard error	T-stat
Shopping	-0.006	0.025	-0.240
Medical	**0.054**	**0.026**	**2.020****
Public service	0.035	0.025	1.410
Culture	**0.053**	**0.025**	**2.080****
Welfare	**0.064**	**0.022**	**2.880*****
Transportation	0.019	0.023	0.800
Parking	**0.045**	**0.023**	**1.980****
Education condition	0.032	0.024	0.133
Safety	**0.109**	**0.028**	**3.800*****
Noise	**0.070**	**0.021**	**3.280*****
Sanitary	**0.167**	**0.027**	**6.100*****
Pollution	**0.176**	**0.029**	**6.020*****
Age	0.000	0.000	0.640
Education	-0.010	0.009	-1.080
Family number	0.013	0.009	1.350
Employment	0.002	0.026	0.110
Income	0.000	0.000	-1.490
Type of house	-0.004	0.010	-0.430
Residential area	0.000	0.000	-0.150
Constants	0.555	0.103	5.380***
Observation	1,787		
R square	0.448		

*** p<0.01, ** p<0.05, * p<0.1

As described above, quality of life is a significant factor affecting the satisfaction of housing supporting policy for the disabled. We analyzed the main factors influencing the quality of life through regression analysis. This study showed that the health, economic status and social relations were statistically significant at a 1% significance level for quality of life of persons with disabilities showing all the same P-value (0.000) (Table 9). This result implies that the more wealthy and healthy the economics, the higher the satisfaction with the quality of life. It is also consistent with previous research showing that the effect of public rental housing policy has an impact on social relation satisfaction of the residents (Choi & Lee, 2015). Age and income were found to be statistically significant at a significance level of 5%, and residential area was statistically significant at a significance level of 1% among the control variables associated with the individual or household characteristics.

Table 9) Analysis of factors influencing quality of life

Variables	Dependent variable: Quality of life		
	Multiple Linear Regression Analysis (MLRA)		
	Coefficient	Standard error	T-stat
Health status	**0.204**	**0.024**	**8.500*** **
Economic status	**0.301**	**0.030**	**9.870*** **
Relationship with family	**0.136**	**0.030**	**4.450*** **
Relationship with others	**0.246**	**0.032**	**7.620*** **
Age	**0.001**	**0.000**	**2.270** **
Education	0.007	0.013	0.540
Family number	-0.010	0.014	-0.710
Employment	-0.016	0.036	-0.460
Income	**0.000**	**0.000**	**2.220** **
Type of house	-0.001	0.013	-0.100
Residential area	**0.001**	**0.000**	**2.950*** **
Constants	-0.012	0.120	-0.100
Observation	1,503		
R square	0.399		

*** p<0.01, ** p<0.05, * p<0.1

Policy Implication and Limitation

In this study, we analyzed the improvement effect of the housing support policy by the HSAU legislation on disabled persons. The purpose of this study is to examine whether the introduction of related laws has a positive effect on the satisfaction level of housing for the disabled. The data analyzed for this study is based on a Housing Survey for the Disabled (HSD) conducted by the government in 2009 and 2015. To minimize the heterogeneity of the treatment group and the control group, the beneficiaries of the five housing support policies, which are legally binding due to the introduction of HSAU among the housing support policies, are defined as the treatment group and the remaining policy beneficiaries are set as the control group. Considering the selection bias, only those with disabilities living in residential facilities, excluding the disabled living in medical services, were analyzed.

First, we analyzed the improvement effect of policy satisfaction on the treatment group and the control group before and after the introduction of HSAU through descriptive statistics[10]. The regression analysis of the underlying causes which improved policy satisfaction showed that the increase in the quality of life and policy satisfaction of the treatment group was higher than that of the control group. It also indicated that the government's housing support policy for the disabled has a certain policy effect due to the introduction of HSAU. Analysis of factors affecting policy satisfaction showed that the residential satisfaction and the quality of life had a positive effect on policy satisfaction. On the other hand, individual or household characteristics such as age, education, family number, income, residential area, except for employment and housing type, do not have statistically significant effects on policy satisfaction. In other words, HSPD have a policy effect in terms of the improvement of the living environment and the satisfaction of life, rather than

[10] This study also empirically confirmed the policy effect through the analysis using MLRA.

individual or household characteristics. This study also showed that the accessibility of main facilities and social environmental factors are more influential on residential satisfaction than other factors. The health status, economic status, and social relations were statistically significant in terms of the quality of life.

Some policy implications can be suggested based on the results of the studies. First, this study confirmed that the introduction of HSAU has increased the satisfaction level of housing support policy. Therefore, by establishing an effective "policy delivery system" (Kang, 2010) and housing support policies, it is possible that the actual policy benefits will reach the underprivileged including the disabled more efficiently.

Second, policy efforts are needed to minimize the negative perceptions and prejudices of the disabled in the community. If social prejudice or misunderstanding of the disabled does not disappear, these obstacles could counter the government's housing support policy. This is because stakeholders with prejudice against the disabled oppose policies related to the disabled. To solve this problem, voluntary participation and efforts from various social groups should be actively implemented in the government and the local community to form the correct perception and social consideration for the disabled in the long term. The research here does not address such opposition but shows that there are benefits of the policy, which are to be considered along with opposing arguments.

This study presented reliable research results by applying descriptive statistics and the MLRA to analyze the policy effect. This study is also meaningful because it directly measures the policy effect of the housing support policy through policy satisfaction. Despite of the contribution, the limitation of this study is the lack of data on the Housing Survey for the Disabled (HSD), which was not carried out continuously for a long time. As a result, we have not been able to analyze more sophisticated policy effects over longer periods.

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