Residential Environment Satisfaction of One-person Households

: Focused on Young (19-39) Women in Korea

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Abstract

Purpose: The purpose of this study is to analyze the residential environment satisfaction of young women's one-person households and the characteristics of young one-person households, and to present policy implications for their housing problems. **Research design, data, and methodology:** This study used 11th Korea Financial Panel Data. Analysis methods in this study include basic statistical analysis, frequency analysis, multiple regression analysis, and artificial neural network analysis. **Results:** As a result of the analysis of this study, 1) young one-person households showed that women had higher ratios of non-regular workers, real estate debt than men, and lower average income. The percentage of young people owning their own homes was very low at about 5%. 2) For young women, the higher the education level and monthly consumption, the lower the housing satisfaction. 3) Young women living in rental housing had lower housing satisfaction than their own. **Conclusions:** Women are paying more for housing security than men in young one-person households. In addition, the proportion of their own houses is very low. Therefore, there is a need for a policy on the housing safety issue of young women's one-person households. And policies to support young one-person households to own their own homes are required.

Keywords : One-person households, Residential Environment, Satisfaction, Artificial neural network

JEL Classification Code : R11, R12, R21, R22, R31.

1. Introduction

Korea is experiencing rapid demographic changes due to the low birth rate and aging population. In addition, the structure of households is changing rapidly. As of the end of the first quarter of 2021, the total number of households in Korea was 23,157,385 households, an increase of 64,277 households (0.28%) from 23,093,108 households at the end of 2020 (Statistics Korea). This is due to the increase in one-person households. There are 9,139,287 one-person households. This accounts for about 40% (39.5%) of all households. And 23.6% for two-person households, 17.3% for three-person households, and 19.6%

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for four-person households (Statistics Korea Social Survey, 2020). The proportion of four-person households, which used to be most common in Korea, has decreased, and one-person households have taken their place. In Korea, one-person households account for the largest proportion. In the past, one-person households were evaluated as temporary households. But as they are recognized as complete households, active research is underway along with interest in one-person households.

The increase in young (19-39 years old) one-person households in Korea was an important factor in the increase in one-person households. As of 2020, among all one-person households, young households accounted for 41.2%, middle-aged households 16.2%, and elderly households 22.6% (Statistics Korea Social Survey, 2020). The percentage of young one-person households was the highest. Korea's long-term economic stagnation has made young people economically vulnerable. As a result, young people became the 'N-po generation', who gave up many things, including employment and marriage. They naturally choose to live alone, which has led to an increase in one-person households.

The problem of young one-person households exists in various forms. Problems of depression, isolation, and loneliness caused by living alone are being raised. A 'home', which should be a place of consolation and comfort for young people, often becomes a cramped and poor living environment. As for the type of housing occupancy of one-person households, monthly rent with a deposit was the highest for 51.8%. Monthly rent with a deposit was also the highest at 60.8% for those in their 20s, and jeonse (rent with deposit only without monthly rent) was the highest at 54.9% for those in their 30s (The Seoul Metropolitan Government, 2020).

As of 2017, the proportion of housing poverty among all households was 12.0%, and among young one-person households, 22.6% were living in poverty (Kim & Yoo, 2021). Housing poverty among young one-person households is relatively high, and it is even more problematic that this ratio is increasing every year. They live in places that do not meet the minimum housing standard (14 ㎡), semi-basement, rooftop rooms, and gosiwon (a very small and cheap room similar to dormitory with a bed, desk, and TV). The housing problems of young people living in gosiwon, rooftop rooms, and semi-basements, which are the poorest housing types of one-person youth households, are serious. There is an urgent need for housing support policies for young one-person households facing housing poverty. And in order to solve the housing problem of these young one-person households, measures to guarantee housing rights are needed.

And the crime rate of one-person households is much higher than that of general households. In particular, the damage is concentrated on young women. The crime victimization rate of one-person households was higher than the overall victimization rate by household type. In particular, young women's one-person households were more likely to be victims of crime than men. This unsafe housing type was cited as one of the causes of crimes against young women's one-person households (Park & Kim, 2015).

As can be seen from the last 'Silrim-dong attempted rape case', the housing safety problem of young women's one-person households is very serious. The number of crimes such as murder, rape, and residential molestation increased by 52.32% from 688 in 2015 to 1,048 in 2018, of which 55.6% of the victim were young women (Korean National Police Agency). This may be due to the lack of legal standard or complacency of the investigative authorities for women's crimes, but there is also the problem of being unable to live in a safe house with low wages (Kim, 2021).

Young women's one-person households choose relatively safe housing for their own safety. Therefore, young women face economic difficulties due to the gender income gap and the higher housing cost burden than men. A more serious problem is that poor women have no choice but to give up safe housing due to economic problems. This puts poor young women in dangerous housing conditions. In this regard, the government's housing safety measures are necessary.

Therefore, this study intends to analyze the following contents. 1) investigation of the problems of young one-person households, 2) research of the gender characteristics of young one-person households, and 3) analysis of the housing satisfaction factors of young women's one-person households.

The purpose of this study is to suggest the following policy implications based on the results of this analysis. 1) implications for housing problem policy for young one-person households, 2) ways to solve problems arising from gender differences among young one-person households, and 3) housing policy implications including housing safety for young women's one-person households.

2. Literature Review

2.1. Review of previous research

In the early days, research on the emergence and rise of one-person households (Yeung & Cheung, 2015; Ronald, 2017) was mainly focused, but it is gradually diversifying. Previous studies related to one-person households are as follows. First,

it is a study on technology to solve the inconvenience of single-person households. Second, studies on the safety of single-person households. Third, studies on elderly single-person households. Fourth, studies on the characteristics of young one-person households.

First, studies on technology to relieve the inconvenience of single-person households are as follows. A study on whether the elderly in single-person households accepted technology in a smart city environment, focusing on artificial intelligence speakers (Yoo, Suh & Kim, 2020). There is a study that designed a mobile application for the prevention of sexual crimes for women's one-person households (Koo & Chon, 2019).

Second, studies on the safety of one-person households are as follows. There is a study on the visualization of indicators of women's safety facilities through the analysis of public data in Seoul (Kim, 2021). There is a study on crime prevention in single-person households by housing type (Hwang, Kang & Park, 2013). There is a study that investigated the actual situation of urban living-type residential environment regarding crime prevention through environmental design, centering on 5 studio-type households in Gwanak-gu, Seoul (Jung, Lee & Lee, 2016). A Study of Fire Prevention Measures for Single-person Households. There is also a study on fire prevention measures for one-person households (Kim & Han, 2021).

Third, studies on elderly one-person households are the study on the prediction model of the elderly depression (Seo, Suh & Kim, 2020), the study on the retirement satisfaction according to the general characteristics of retired elderly (Kim, 2019), the study on the effects of economic and financial stress on the satisfaction of living for the elderly (Kim & Um, 2019). Srivastava, Kumar & Singh (2021) studied gender differences in single-person households among the elderly in India using evidence from the National Family Health Survey 2015–2016.

Fourth, studies on the characteristics of young one-person households are as follows. There is a study analyzing the factors affecting the housing tenure of young single-person households applying the multinomial logit model (Lee, 2016). There is a study on the housing cost burden of single or two-person households in their 20s and 30s in the United States (Lee, 2012). There is a study on the housing characteristics and determinants of housing cost burden of young single or two-person households in the metropolitan area of the United States (Choi & Lee, 2014). There are also studies on work-leisure balance of young single-person households (Yang & Jeong, 2019)), leisure activities of single-person households in Korea (Jeong & Yoon, 2018), the study on the increase in the death of loneliness among young single-person households (Park, 2018), and the study on the actual state of space composition of a share house for single-person households (Ryu & Chu, 2020).

Previous studies of one-person women's households that are highly relevant to this study are as follows. Kim, Chung & Nam (2018) studied on the current status of one-person women's households for policy improvement: Focusing on Gyeonggi Province with secondary data analyses. Kim (2013) studied on housing consciousness and needs of one-person women's household for the small-sized rental housing development: Focused on the residents of Seoul, Incheon, and Gyeonggi. Kim & Han (2014) proposed a residential environment for one-person women's households through the CPTED guidelines by studying single female households in their 20s and 30s living in one-person households in Seoul.

2.2. Research Differentiation

Previous studies on one-person women's households have suggested the current status of one-person women's households, the housing consciousness and needs of one-person women's households, and the living environment of one-person women's households. Currently, the housing safety issue of young women's one-person households in Korea is being raised seriously. Therefore, this study analyzed the factors of housing satisfaction among young people (19-39 years old) among female single-person households and compared them with the characteristics of young male single-person households to provide policy implications.

3. Methodology

3.1. Data

Data used in this study is the 11th Korea Financial Panel Data surveyed in 2019. This data was suitable to analyze the factors of residential environment satisfaction because it surveyed residential environment satisfaction on a Likert 5-point scale. The demographic, financial, and housing and residential characteristics of households were shown in detail.

The financial panel survey method was face-to-face interview, where the interviewer and the interviewee carried out one-on-one interview. The population of this data is residents of 15 cities and provinces across the country, excluding Jeju Island.

This data shows the financial characteristics of one-person households by subdividing household debt. The analysis targets of this study were one-person households aged 19 to 39: 169 households (80 women and 89 men) out of total 4,770 households.

3.2. Research problem and Analysis method

Hypothesis 1: Is there a difference in characteristics between male and female in the one-person households aged 19 to 39?

Analysis method 1: The analyzing method was frequency analysis and basic statistics. Through this method, the differences between the two groups of male and female of one-person household aged 19 to 39 could be identified. Household characteristics were divided into the demographic, financial, and residential characteristics. In addition, frequency analysis was used for nominal variables and basic statistics were used for continuous variables.

Hypothesis 2: What are the factors affecting the residential environment satisfaction in young women's one-person household?

Analysis method 2: The method of analyzing was Regression Analysis and Neural Network Analysis Method. Multiple regression analysis is widely used as a method to find significant variables among various variables (Aldulaimi, 2021). Multiple regression analysis was performed with three factors (demographic, financial, and residential characteristics). Also, neural network analysis analyzed the relative influence of major variables affecting the satisfaction of the residential environment in young women's one-person households.

4. Research Results

4.1. Gender characteristics of young one-person households

The frequency analysis of the demographic characteristics of one-person households, which are young people (ages 19-39), is as follows   Table 1. First, as for marital status, the unmarried ratio of young women's one-person is 96.3%. This is about 10% more than the unmarried rate of 86.5% of young men's one-person. Second, the proportion of non-regular workers was higher in women (11.3%) than men (7.9%). The percentage of regular workers was higher for men (78.7%) than for women (75.0%). This shows that women have a poorer employment status than men. And the self-employment rate was higher among women (6.3%) than men (4.5%). The percentage of unemployed women (6.3%) was higher than that of men (5.6%).Third, as for the level of education, the ratio of college graduates was higher in women (92.5%) than men (49.5%). Fourth, the proportion of residence by region was similar for men and women.

Table 1: Demographic Characteristics Frequency Analysis

Demographic characteristics		Men(%)	Women(%)
Marital Status	Married (Having a spouse)	9.0	3.8
	Married (Bereavement)	0.0	0.0
	Married (Divorce)	4.5	0.0
	Single	86.5	96.3
Age	19~29years	13.5	3.8
	30~39years	86.5	96.3
Job	Salaried Employee (Full-time Position)	78.7	75.0
	Salaried Employee (Temporary Position)	7.9	11.3
	Salaried Employee (Daily Employment)	3.4	1.3
	Self-Employed	4.5	6.3

	Not Employed	5.6	6.3
Education Level	Below High School Graduation	50.5	7.5
	College Graduation	46.6	83.8
	Graduate school Graduation	2.9	8.8
Residential District	Seoul City	1.1	1.3
	Metropolitan City	5.6	5.0
	Gyeonggi-do	1.1	3.8
	Other Area	92.1	90.0

The basic statistics of financial characteristics in young people's one-person households are as shown in Table 2. The average value of income was higher for men than for women. The average of total expenditure was similar for men and women. But the average total housing costs ratio was higher for women than for men.

Table 2: Financial characteristics Basic Statistics

Financial characteristics(10,000won, %)		Men(persons, 10,000won, %)				Women(persons, 10,000won, %)			
Categories	Variables	N	Min	Max	Mean	N	Min	Max	Mean
Income	Gross Annual Income	89	480	8,160	3,295	80	0	8,270	2,921
	Average Monthly Income	89	63	574	267	80	20	560	233
Expenses	Gross Annual Expenditure	89	849	6,146	2,289	80	461	13,399	2,288
	Gross Monthly Expenditure	89	50	372	160	80	50	300	135
	Total Monthly Housing Costs	89	0	420	119	80	0	270	120
	Monthly Residence Expenses	89	0	35	10	80	0	23	10
	Monthly Rent	42	10	80	32	47	8	360	39
Saving	Monthly Savings	73	10	300	77	65	0	320	58
	Total Financial Deposit	73	90	12,000	1,882	65	100	10,000	1,766
Assets	Total Assets	85	150	222,400	8,385	77	200	71,900	6,489
	Total Real Estate Assets	65	100	222,000	6,014	64	200	65,500	5,600
	Total Financial Assets	80	100	12,096	1,823	66	100	10,000	1,998
	Housing Price	4	12,600	110,000	38,400	4	7,300	65,000	24,950
	Rent Deposit	60	100	16,500	3,268	59	200	25,500	3,179
	Car Price	45	110	3,600	1,081	7	100	1,800	966
Debt	Total Amount of Debt	8	300	16,000	520	7	2,500	28,000	9,971
	Finance Debt	5	300	3,050	104	6	1,350	9,800	3,525
	Real Estate Debt	3	8,000	16,000	416	3	3,500	28,000	15,500
	Short-Term Repayment	7	6	300	10	7	60	2,000	712
	Finance Repayment	5	6	300	5	6	60	2,000	631
	Real Estate Repayment	2	150	260	5	1	1,200	1,200	1,200
Financial Ratio	Household Account Balance	89	24.5	117.6	62.9	80	24.8	250.0	66.7

Total Housing Costs Ratio	89	0	180.0	51.3	80	0	618.0	67.4
Monthly Housing Cost Ratio	89	0	15.0	4.3	80	0	52.5	6.6
Savings Ratio	73	6.0	64.3	23.2	65	10.6	76.2	27.9

The average value of savings, real estate assets, and real estate liabilities was higher for women than for men. In this study, real estate assets include deposits for rental housing since the ratio of owner-occupied houses is low.

The frequency analysis of housing and residential characteristics in young people's one-person households are as shown in Table 3. First, it was found that Korean women (21.3%) preferred Korean officetel(urban living complex type with offices and shops on the lower floors) compared to men (10.0%). These results are also related to the preference of women's one-person households for residential safety. Second, the type of residence appeared in the order of monthly rent with deposit, free charge residence, Jeonse, and monthly rent without deposit for both men and women. Jeonse is Korea's unique housing rental system, and it is a system in which a house is rented only with a large deposit without monthly rent.

Among the types of housing, free charge residence type for men was composed of company's housing (41.7%), dormitories (8.3%), family-owned house (37.5%), and house owned by others (12.5%). In the case of women, free charge residence type was composed of company's housing (17.6%), dormitories (17.6%), and family-owned house (64.7%).

In free charge residence type, men had a high proportion of company's housing and women had a high proportion of family-owned house. Third, the proportion of self-owned housing was very low at 4.5% for men and 5% for women. This result proves the difficulties of the younger generation in buying their own homes. The task of preparing various policies for the stabilization of housing for young people is urgent. There was not much difference between men and women in the satisfaction of the residential environment.

Table 3: Residential Characteristics Frequency Analysis

Demographic characteristics			Men(%)	Women(%)
Housing Type		House	12.4	12.5
		Korean Apartment	32.6	26.25
		Multi-units House	10.1	8.75
		Korean Officetel	10.1	21.3
		Mixed-use House	1.1	6.3
		Studio	33.7	25
Residential Type		Self-Owned Housing	4.5	5
		Jeonse	21.3	16.25
		Rent with Deposit	46.1	56.25
		Rent without Deposit	1.1	1.25
		Free Charge Residence	27.0	21.25
Residential Environment Satisfaction Level (LIKERT 5-point)		1	2.2	1.3
		2	50.6	48.8
		3	43.8	46.3
		4	2.2	2.5
		5	1.1	1.3

4.2. Multiple Regression

The results of residential environment satisfaction multiple regression analysis in young women's one-person households are as shown in Table 4. The regression analysis was conducted by separating demographic, financial, and housing and

residential characteristics. As a result, the only meaningful variable was the educational level. It was analyzed that the higher the educational level (over college graduates), the lower the satisfaction level of the residential environment.

Women with high level of education have high expectation for living space. However, the gap between expectations and reality serves as a factor in reducing their satisfaction with the residential environment.

Table 4: Multiple Regression Result

Model		Standardized Coefficient B	t	Significance Level
Demographic Characteristics R²=.199	Constant		5.78	.000
	Single=1	.035	.33	.740
	Age	-.239	-2.04	.045
	Salaried Employee=1	-.025	-.208	.836
	Self-Employed=1	-.150	-1.20	.234
	College Graduation=1	-.363	-3.31	.001
	Seoul·Metropolitan·Gyeonggi=1	-.009	-.08	.939
Financial Characteristics R²=.102	(Constant)		1.55	.126
	log (Average Monthly Income)	-.082	-.39	.695
	log (Monthly expenditure)	-.253	-1.59	.116
	log (Monthly savings)	-.723	-1.36	.179
	Log (Monthly Housing Costs)	.554	1.07	.286
Residential Characteristics R²=.051	Constant		6.03	.000
	House=1	.188	.81	.421
	Apartment=1	-.079	-.27	.786
	Multi-units House=1	.062	.30	.768
	Korean Officetel=1	.047	.17	.865
	Mixed-use House=1	.062	.38	.703
	Studio=1	.112	.39	.698
	Self-Owned Housing=1	.067	.51	.616
	Jeonse=1	-.007	-.05	.960
	Free Charge Residence=1	.077	.59	.560

* Dependent variable: Residential Environment Satisfaction Level

4.3. Neural network analysis

Neural network analysis can identify the relative importance of variables which multiple regression analysis cannot (Sanusi, Moosin, & Kusairi, 2020; Chan, Ho, & Tsang, 2021). Thus, this study also identifies the relative importance of variables that affect the satisfaction of the residential environment of young women's one-person households through neural network analysis. The results are as shown in the following Table 5.

In neural network analysis, the directionality of the variable is unknown, and only the relative magnitude of its importance is shown. So, the directionality is referred to the results of the multiple regression analysis in Table 4 above. The variables that have the greatest influence on the satisfaction of living environment by characteristics are as follows. The demographic characteristic variable is college graduate, the financial characteristic variable is log (monthly consumption), and the residence characteristic variable is house=1. The orientation of the variable is negative for college graduates and log (monthly consumption), and the direction of house=1 is positive. It means that the higher the level of education and the monthly

consumption, the lower the residential environment satisfaction. It also means that the satisfaction level of the residential environment is higher when you live in house.

Table 5: Independent Variable Importance by Neural Networks Analysis

Model	Case Processing Summary	Variable	Importance	Normalization Importance
Demographic characteristics	Training:56, 70% Verification:24, 30% Number of hidden floors: 1 Number of units in hidden floor 1: 2	College Graduation=1	.294	100.0%
		Age	.253	86.1%
		Self-Employed=1	.223	75.9%
		Single=1	.175	59.5%
		Salaried Employee=1	.037	12.6%
		Seoul·Metropolitan·Gyeonggi=1	.017	5.9%
Financial characteristics	Training: 56, 70% Verification: 24, 30% Number of hidden floors: 1 Number of units in hidden floor 1: 3	log(Monthly expenditure)	.529	100.0%
		log(Monthly Housing Costs)	.285	53.8%
		log(Average Monthly Income)	.173	32.7%
		log(Monthly savings)	.014	2.6%
Housing Residence characteristics	Training: 56, 70% Verification: 24, 30% Number of hidden floors: 1 Number of units in hidden floor 1: 3	House=1	.207	100.0%
		Multi-units House=1	.182	88.0%
		Apartment=1	.159	76.8%
		Free Charge Residence=1	.117	56.3%
		Studio=1	.113	54.7%
		Self-Owned Housing=1	.085	41.1%
		Korean Officetel=1	.067	32.2%
		Mixed-use House=1	.037	17.9%
		Jeonse=1	.032	15.5%

5. Conclusion

5.1. Results

This study analyzed the differences in the characteristics of men and women in one-person household among young Koreans. And the factors of housing satisfaction among young female single-person households were analyzed. The analysis results are as follows.

First, the gender differences in the characteristics of young (19-39 years old) one-person households were that women had higher rates of non-regular workers, savings, real estate assets, and real estate liabilities than men, and lower average income. Women preferred officetel to men, and the rate of young people owning their own homes was very low at about 5%.

Second, as a result of multiple regression analysis of housing satisfaction factors of young female single-person households, the higher the educational background (university graduate or higher), the lower the satisfaction. The higher the level of education, the higher the standard for housing. However, house prices and rent prices have skyrocketed in recent years. Therefore, it has become difficult for young women to find housing that meets their housing standards in reality. It can be seen that the analysis results reflect this situation.

Third, the results of neural network analysis are as follows. Among the demographic variables, education level (university graduate or higher) had the most influence. As for the financial characteristic variable, log (monthly consumption) had the most influence. Among the residence characteristic variables, the housing type (in the case of a house) had the most influence. The higher the education level, the higher the monthly consumption, and the lower the residential environment satisfaction. The higher the residence, the higher the satisfaction with the living environment.

5.2. Implication

First, as for the employment status of young people, the percentage of regular workers was higher for men than women, and the percentage for non-regular workers was higher for women than men. This means that women are less likely to be employed than men and may be economically vulnerable. The average income of young one-person households was higher for men than for women. The average of total spending was similar for men and women. However, the average total housing cost ratio was higher for women than for men. The average real estate debt was higher for women than for men. Korean Young women (21.3%) preferred a safer residential type of officetel than men (10.0%). This suggests that women are paying more for housing safety than men. The government needs to come up with a policy for the housing safety of single-person young female households.

Second, the percentage of young one-person households owning a house is very low. This means that it is urgent to come up with a policy that allows young people to own their own housing. The policy should consider various methods such as housing supply policies and financial support measures.

Third, the results of neural network analysis suggest the following implications. Women living in houses and apartments were more satisfied with their housing than women living in one-room. This suggests that housing safety is an important factor in the housing satisfaction of young women's one-person households. And the housing satisfaction of self-owned young women's one-person households was high. This can be seen as a higher level of housing satisfaction among self-owned women than women living in rental housing because they do not have the stress of housing insecurity. Therefore, the government should come up with a policy that considers women's safety issues when supplying rental housing for one-person households. In addition, it is necessary to prepare a policy on housing safety measures for young women's one-person households currently in housing poverty.

References

Aldulaima, S. H. (2021). Rational Leadership for the Middle East: A Multiple Competencies Model. *The Journal of Asian Finance, Economics and Business, 8*(4), 687-697.

Chan, E. M. H., HO, D. C. K., & Tsang, C. W. (2021). Estimating United States-Asia Clothing Trade: Multiple Regression vs. Artificial Neural Networks. *The Journal of Asian Finance, Economics and Business, 8*(7), 403-411.

Choi, B., & Lee, H. J. (2014). Housing Characteristics and Determinants of Housing Cost Burden of Young Single- or Two-person Households in the U.S. Metropolitan Areas. *Journal of the Korean Housing Association, 25*(1), 51-61.

Hwang, S. E., Kang, B. S., & Park, J. Y. (2013). A Research Study on Crime Prevention for One-person Households by Type of Houses. *Journal of the Korean Housing Association, 24*(4), 9-17.

Jeong, Y. K., & Yoon, S. Y. (2018), The Leisure behaviors of single households in Korea: A generational analysis. *Korean Family Resource Management Association, 22*(4), 1-15.

Jung, Y. H., Lee, Y. M., & Lee, Y. J. (2016). The Actual Condition investigation of Residental Environment of Urban Life-Type Housing Regarding Crime Prevention Through Environmental Design -Focused on Five Single Households in studio-type housings in Gwanak-gu, Seoul Urban Life-Type Housing-. *Journal of the Korea Institute of Ecological Architecture and Environment, 16*(6), 39-50.

Lee, H. J. (2012). Housing Cost Burden of Single- or Two-person Households in Their 20s and 30s in the United States. *Journal of the Korean Housing Association, 23*(2), 69-77.

Lee, M. S. (2016). Analysis on the Factors Affecting Housing Tenure of Single-Person Households of Young Generation Employing the Multinomial Logit Model. *Journal of the Korea Academia-Industrial Cooperation Society, 17*(6), 469-481.

Park, S. S. (2018). Increased Youth Single-person Households and Solitary Deaths realized by College Students. *Journal of Digital Convergence, 16*(12), 635-640.

Park, S., & Kim, H. S. (2015). Relationship Between Social Support Factors and Major Crimes in Korean Capital Area. *The Journal of Korea Regional Science Association, 31*(4), 3-24.

Ronald, R. (2017). The Remarkable Rise and Particular Context of Younger One–Person Households in Seoul and Tokyo. *City & Community,*

16(1), 25-46.

Ryu, J. W., & Chu, B. (2020). A study on the status of sharehouse' Space Composition for a single Household Living Facilities. *Journal of the Architectural Institute of Korea, 36*(6), 55-61.

Sanusi, N. A., Moosin, A. F., & Kusairi, S. (2020). Neural Network Analysis in Forecasting the Malaysian GDP. *The Journal of Asian Finance, Economics and Business, 7*(12), 109-114.

Seo, B. S., Suh, E. K., & Kim, T. H. (2020). A Study on the Prediction Model of the Elderly Depression. *The Journal of Industrial Distribution & Business, 11*(7), 29-40.

Srivastava, S., Kumar, P., & Singh, S.H. (2021). Gender Differentials in One-Person Households among Older Adults in India: Evidence from the National Family Health Survey 2015–2016. *Ageing International, 46*, 200–215.

Kim, H. G. (2021). Visualization of women's safety facility index based on public data analysis: Focusing on Seoul. *Journal of Digital Convergence, 19*(4), 19-24.

Kim, J. E., Chung, H., & Nam, Y. (2018). A Study on the Current Status of Female Single-person Households for Policy Improvement: Focusing on Gyeonggi Province with Secondary Data Analyses. *Korean Journal of Family Welfare, 23*(3), 463-488.

Kim, J. J. (2019). A Study on the Retirement Satisfaction according to the General Characteristics of Retired Elderly. *The Journal of Industrial Distribution & Business, 10*(12), 25-34.

Kim, J. J., & Um, K. H. (2020). A Study on the Effects of Economic and Financial Stress on the Satisfaction of Living for the Elderly. *The Journal of Economics, Marketing and Management, 8*(1), 29-35.

Kim, J. K., & Han, D. H. (2021). A Study of Fire Prevention Measures for Single-person Households. *The Journal of the Convergence on Culture Technology, 7*(1), 424-431.

Kim, J. S. & Yoo, S. H. (2021). Perceived Health Problems of Young Single-Person Households in Housing Poverty Living in Seoul, South Korea: A Qualitative Study. *International journal of environmental research and Public Health, 18*(3), 1-16.

Kim, J. Y. (2013). Housing Consciousness and Needs of Single Woman Household for the Small-sized Rental Housing Development - Focused on the Residents of Seoul, Incheon, and Gyeonggi -. *Journal of the Korean Housing Association, 24*(4), 109-120.

Kim, S. H., & Han, H. R. (2014). Proposal for Housing Environment for Single Woman Household through CPTED Guideline - Focusing on Single Woman Household in their Twenties and Thirties Residing in a Single House in Seoul -. *Korean Institute of Interior Design Journal, 23*(6), 160-168.

Koo, D. H., & Chon, W. J. (2019). Designing a Mobile Application for Prevention of Sex Crimes for Single Women's Households. *Journal of Digital Convergence, 17*(12), 489-501.

Yang, J., & Jeong, Y. (2019). Work-Leisure Balance of Employed Young-Single-Households. *Journal of Korean Family Resource Management Association, 23*(2), 17-40.

Yeung, W., & Cheung, A. (2015). Living alone: One-person households in Asia. *Demographic Research, 32*, 1099-1112.

Yoo, H. S., Suh, E. K., & Kim, T. H. (2020). A Study on Technology Acceptance of Elderly living Alone in Smart City Environment: Based on AI Speaker. *The Journal of Industrial Distribution & Business, 11*(2), 41-48.

The Seoul Metropolitan Government, 2020, 2020 Seoul Welfare Survey.

Statistics Korea, 2020, Social Survey.

Korean National Police Agency : https://www.police.go.kr/www/open/publice/publice0202.jsp

Statistics Korea : kosis.kr