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Housing insecurity and health among people in South Korea: focusing on tenure and affordability

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ABSTRACT

Objectives: Housing is one of the social determinants of health, and the evidence of its impact in this area has been increasingly expanded. However, in spite of its importance, there have been few studies to investigate an association between housing and health in Korea. Our study aimed to investigate housing tenure and affordability and their effects on health outcomes in Korea.

Study design: We selected 9456 participants from the 10–11th wave of the Korea Welfare Panel Study, after excluding missing variables. Housing tenure and affordability were chosen as independent variables, and depressive symptoms and self-rated health were selected as dependent variables.

Methods: Logistic regression was implemented to investigate the association between housing tenure/affordability and health outcome, and all covariates such as sex, age, and household income were adjusted.

Results: Compared with homeowners, renters are more likely to have depressive symptoms (odds ratio [OR]: 1.26, 95% confidence interval [CI]: 1.08, 1.47) and poor self-rated health (OR: 1.38, 95% CI: 1.19–1.61). Also, health effects of housing unaffordability were observed differently by tenure, showing that the likelihood of having depressive symptoms (OR: 1.56, 95% CI: 1.15, 2.13) and poor self-rated health (OR: 1.51, 95% CI: 1.10, 2.06) is significantly high among renters who reported unaffordability.

Conclusion: This study could provide evidence of housing as a determinant of health by showing that both housing tenure and affordability are significantly related to health outcomes.

Introduction

Recently, a growing number of reports indicate that housing, as a social determinant, has a large impact on health outcomes. Previous studies showed the health consequences of living in a house in poor physical condition, including the presence of toxic chemicals and dampness, and the poor quality of ventilation.[1] Some health consequences included infectious and respiratory disease[2–4] and self-reported symptoms such as physical fatigue.[5,6] Current studies have expanded to investigate housing affordability and tenure.[7,8] It is well documented that renters, more often than homeowners, have poor health because homeowners have plentiful

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disposable resources to spend on necessary expenses, even if housing is overpriced.[9,10] Furthermore, owning a home, in itself, can provide a great sense of prestige and emotional stability.[11,12] However, low-income households struggle to possess their homes and, what is worse, they face a high burden of housing expenditure, also called housing unaffordability, making it hard to find a decent home. Housing unaffordability increases psychosocial stress and also reduces other necessary expenditures, such as food and education.[4] As a result of the inability to pay for a mortgage, people occasionally face evictions and foreclosure, which cause depression and suicidal behaviors.[13–15] Fundamentally, the home's ontological meaning critically matters[16,17] because residents construct self-identities through their day-to-day lives in this place where they spend most of their time.[2,16]

Many countries have introduced policies to guarantee that all people can enjoy housing rights. South Korea (hereafter Korea), one of those countries, has also paid attention to housing issues for a long time.[18,19] Since the late 1980s, Korea has invested in the housing market and successfully supplied housing options for a short period of time.[20] However, housing problems are still widespread. For example, according to the Organization for Economic Co-operation and Development (OECD), it is reported that dwellings per 1000 inhabitants were 364 as of 2010 in Korea, comparatively lower than those in Japan (451 as of 2008) and France (532 as of 2010). In addition, people who own their home outright account for 37.8% of tenure types as of 2014 (or latest year available). This is lower than the average of OECD members (47.1%). Ha[21] pointed out that people in low- and middle-income households have restricted options for finding and purchasing their homes in Korea.

Unfortunately, in comparison to increasingly extensive studies about the physical conditions of house and neighborhood effects,[3] only a few studies have explored housing unaffordability and its effect on health, taking into consideration tenure. In Korea as well, there has been limited evidence of housing effects on health, especially concerning affordability. For instance, one notable study examined the health consequences of poor physical condition and tenure, independently,[22] but housing affordability was not considered in this study. To reduce the knowledge gap, this study aims to investigate an association between housing insecurity and health outcomes among Koreans. To be specific, this study investigated how housing tenure and affordability are associated with health outcomes, such as self-rated health and depressive symptoms. Based on existing reports, this study investigates the following research questions. First, do renters have a higher prevalence of depressive symptoms and poor self-rated health than homeowners? Second, does housing unaffordability increase the likelihood of having health problems? Finally, is the association between housing unaffordability and health moderated by housing tenure?

Methods

Data collection and study participants

This study used data from the Korea Welfare Panel Study (KOWEPS), a nationally representative longitudinal study jointly conducted by two institutions, the Korean Institute for Health and Social Affairs and Seoul National University. The KOWEPS has been collected annually through personal interviews since 2006. Participants initially included 18,856 individuals from 7072 households; however, the final number of participants for analysis was 9456 after we excluded households who moved to other place from 1st year to 2nd year. We also used 10th wave (hereafter 1st year) for independent variables and 11th wave (hereafter 2nd year) for dependent variables for analysis.

Variables

Dependent variables: depressive symptoms and self-rated health

We used depressive symptoms and self-rated health as dependent variables. For the variable of depressive symptoms, the Korean short version of the Centers for Epidemiology Studies Depression Scale (CES-D 11) was selected. A cutoff score of 9 decided the presence of depressive symptoms among CES-D 11 scores that ranged from 0 to 33. Second, participants are required to answer in a 5-point Likert scale (1 = very good, 5 = very bad) the following self-rated health question: "How is your self-rated health?" We divided those who have responses of 1–3 and 4–5 into two groups, as good health (0) and poor health (1), respectively.

Independent variables: housing tenure and affordability

As an independent variable, housing tenure was measured, using a single-item question, "What type of housing tenure do you have as of the 31st of December this year?" Respondents were required to select (1) outright owners, (2) renters with Jeon-se system, (3) monthly rent with security deposit system, (4) monthly rent, and (5) others. Jeon-se refers to a lease system in which tenants pay a housing deposit for the right to dwell for two years or longer. We excluded the group 'others (6)', and total groups were categorized into two groups: tenure (1) and rental (2–5). Then, housing-related expenditure was calculated by summarizing the amount of debt redemption for purchasing, monthly rent, and housing expenses (e.g., administration costs for apartment maintenance, fuel, electricity, and water). There is no standard definition for housing affordability, but many previous studies commonly have used a 30% standard for the amount of income that households could spend and still have enough remaining for other spending.[23] Therefore, people who have housing expenditures that take up 30% or more of their household incomes were categorized as having housing unaffordability; otherwise, they were categorized as being in the affordable group. Finally, we divided participants into four groups according to housing tenure and affordability status: (i) owners with housing affordability, (ii) owners with housing unaffordability, (iii) renters with housing affordability, and (iv) renters with housing unaffordability.

Covariates

We included demographic and socio-economic characteristics as covariates for analysis: age, sex, marital status, education attainment, economic activity, place of residence, and

household income. First, age was classified into four groups: <39, 40–49, 50–59, ≥60 years. Educational attainment was divided into junior-high-school (or lower) graduate, high-school graduate, and college graduate (or higher). Marital status was categorized as married, divorced/separated/widowed, and unmarried. In addition, a variable for place of residence was either urban or rural, and economic activities were categorized into economically active or economically inactive/unemployed. Finally, with the inclusion of earnings, interest, and dividends, household income variables were stratified into five groups from the lowest to the highest.

Statistical analysis

In the first phase, descriptive statistics on sociodemographic characteristics of the sample, the prevalence of depressive symptoms, and self-rated health were calculated by each covariate using a chi-squared test. The second phase implemented bivariate regression to examine the association between housing condition (tenure and affordability) and health outcome. In the third phase, we investigated how the interaction of housing tenure and affordability affects health outcomes. In all process of regression analysis, model 1 and model 2 adjusted for covariates, such as demographic and socio-economic status. In model 3, we controlled for outcome at a baseline to explore time-lagged effect. STATA/SE, version 12.0 (Stata Corp, College Station, TX) was used for all analyses.

Results

Descriptive analysis

Table 1 presents the total distribution of the study population, the prevalence of depressive symptoms, and poor self-rated health by covariates. Above all, respondents with tenure accounted for 71.9% of total population, relatively higher than the proportion of rental housing (28.1%). Also, the proportion of people with housing affordability (94.7%) was higher than the proportion of housing unaffordability (5.4%). To be specific, more than half of the participants have responded to live as homeowner with affordability (69.3%), a few participants reported that they are homeowners with unaffordability (2.7%), and renters with unaffordability made up 2.6% of total participants. Age variations were observed, showing that 46.7% were in their 60s on average, followed by 30s on average (18.8%). Consecutively, participants included those who had educational qualification of junior high school or less (44.6%) and are married (67.2%). Those who live in rural areas (56.9%) are more frequently observed.

Generally, the prevalence of depressive symptoms and poor self-rated health are 13.5% and 20.2%, respectively. The prevalence of depressive symptoms was commonly observed among participants who had rental housing (17.5%) and housing unaffordability (28.1%). Also, a higher proportion was observed in those who were divorced/separated/widowed (26.0%) and have the lowest household income (28.0%). Similar patterns were observed in the prevalence of poor self-rated health. People who had both rental housing and unaffordability showed the highest prevalence of poor self-rated health (47.5%), which is comparatively higher than those who had a housing tenure of affordability (19.0%); in addition, this included the groups who were divorced/separated/widowed (37.0%), were economically inactive/unemployed (32.8%), and had lower household income (44.1%).

Housing tenure, affordability, and health outcome

Table 2 showed the results for the effects of housing tenure/affordability on health including depressive symptoms and self-rated health. Model 1 represented that, after adjusting for socio-economic status (age and educational attainment), renters were more likely to have depressive symptoms (odds ratio [OR]: 1.46; 95% confidence interval [CI]: 1.27, 1.69) and poor self-rated health (OR: 1.47; 95% CI: 1.28, 1.68). In Model 2, it showed that housing tenure had a significant impact on respondents' depressive symptoms (OR: 1.44; 95% CI: 1.24, 1.66). These results are consistent with the patterns of poor self-rated health (OR: 1.46; 95% CI: 1.27, 1.68). After controlling for health outcomes at a baseline (1st year), compared to reference group, respondents who lived in a rented dwelling had a higher possibility of having depressive symptoms (OR: 1.26; 95% CI: 1.08, 1.47) and poor self-rated health (OR: 1.38; 95% CI: 1.19, 1.61). Respondents who had housing unaffordability showed a greater likelihood of reporting depressive symptoms and poor self-rated than those who had affordable housing; however, the results were not statistically significant.

Table 3 indicated the effects of housing tenure with affordability on health outcomes that contain depressive symptoms and poor self-rated health. First, renters who reported unaffordability were more likely to have depressive symptoms (OR: 4.77: 95% CI: 3.59, 6.32) than homeowners with housing affordability. After adjusting for covariates and outcomes at baseline, the likelihood of having depressive symptoms was the highest among renters with housing affordability (OR: 1.56: 95% CI: 1.15, 2.13), followed by renters with housing affordability (OR: 1.24; 95% CI: 1.06, 1.45). These patterns are similar to the results of self-rated health. After adjusting for covariates in model 3, the OR was the highest among renters who responded to have housing unaffordability (OR: 1.51; 95% CI: 1.10, 2.06). Also, people who are renters with housing affordability, consecutively, showed the likelihood of having poor self-rated health (OR: 1.37; 95% CI: 1.17, 1.60).

Discussion

In spite of increasing interests in housing as a social determinant of health, there have been few studies that investigate the health consequences of its non-physical aspects, such as the financial burden of housing expenditure. To overcome this limitation, this study aimed to explore the association between housing insecurity and health outcomes in Korea, with consideration of housing tenure and affordability, respectively. To start, it was revealed that housing tenure is significantly related to depressive symptoms and poor self-rated health. Its association remained significant consistently after covariates were fully adjusted. Second, housing unaffordability, or housing expenditure exceeding 30% of the

Table 1 – Descriptive statistics of study population and the prevalence of depressive symptoms and poor self-rated health (N = 9456).

Characteristic	Total distribution		Depressive symptoms			Poor self-rated health		
	N	%	N	%	p-value[a]	N	%	p-value[a]
Total	9456	100.0	1277	13.5		1914	20.2	
Type of tenure								
Owners	6802	71.9	813	12.0	<0.001	1320	19.4	<0.001
Renters	2654	28.1	464	17.5		594	22.4	
Housing affordability								
Affordability	8950	94.7	1135	12.7	<0.001	1716	19.2	<0.001
Unaffordability	506	5.4	142	28.1		198	39.1	
Tenure and affordability								
Owners with affordability	6553	69.3	768	11.7	<0.001	1244	19.0	<0.001
Owners with unaffordability	2490	2.6	45	18.1		76	30.5	
Renters with affordability	2397	25.4	367	15.3		472	19.7	
Renters with unaffordability	257	2.7	97	37.7		122	47.5	
Sex								
Male	4080	43.2	386	9.5	<0.001	685	16.8	<0.001
Female	5376	56.9	891	16.6		1229	22.9	
Age (years)								
≤30s	1780	18.8	138	7.8	<0.001	39	2.2	<0.001
40s	1651	17.5	98	5.9		87	5.3	
50s	1603	17.0	160	10.0		205	12.8	
60+	4422	46.8	881	19.9		1583	35.8	
Educational attainment								
Junior high (or less)	4219	44.6	849	20.1	<0.001	1476	35.0	<0.001
High-school graduate	2670	28.2	253	9.5		300	11.2	
College graduate (or higher)	2567	27.2	175	6.8		138	5.4	
Marital status								
Married	6347	67.1	652	10.3	<0.888	1139	17.9	<0.001
Divorced/separated/widowed	1899	20.1	493	26.0		702	37.0	
Not married	1210	12.8	132	10.9		73	6.0	
Place of residence								
Urban	4075	43.1	548	13.4	<0.001	807	19.8	<0.357
Rural	5381	56.9	729	13.5		1107	20.6	
Economic activities								
Active	5566	58.9	480	8.6	<0.001	639	11.5	<0.001
Inactive/unemployed	3890	41.1	797	20.5		1275	32.8	
Household income								
1Q	2047	21.7	574	28.0	<0.001	902	44.1	<0.001
2Q	1988	21.0	319	16.0		516	26.0	
3Q	1820	19.3	185	10.2		248	13.6	
4Q	1795	19.0	108	6.0		157	8.7	
5Q	1806	19.1	91	5.0		91	5.0	

[a] Chi-squares test.

household income, was not significantly observed to increase the likelihood of having depressive symptoms and poor self-rated health, although previous studies suggested this connection.[3] However, as presented in Table 3, when we investigated the interactive effects of tenure and affordability by categorizing them into four groups, their associations with health outcomes were differently presented. Among the four groups, renters with housing unaffordability were the most vulnerable to having depressive symptoms and poor self-rated health, while the likelihood of having both outcomes was not significantly present among homeowners, who responded to having housing unaffordability, after adjusting for covariates.

First of all, with regard to the health effects of housing tenure, existing studies give an explanation that homeownership, in itself, can be beneficial for increasing physical outcomes and psychological benefits such as emotional stability and a sense of control, even if homeowners have to pay for their mortgages.[3,24–26] Also, coping with a life-course event can be one of the mediators between homeownership and mental health. To be specific, if homeownership is given to people, their ability to deal with stress makes them resilient to shock events[4,11,27] because homeownership can strengthen the sense of control over life-course events in the long run.[26,28] In addition, homeowners, more than renters, perceive their health better through the pathway of trust in their neighborhoods. This is because possessing a house means not only an individual sense of comfort but also belongingness to a neighborhood, also called 'place attachment'.[28,29]

On the other hand, when it comes to this study's findings around the effects of housing affordability on health, which are somewhat inconsistent with previous reports, several

Table 2 – Association between housing tenure/affordability and depressive symptoms/self-rated health.

Housing tenure and affordabiilty	Outcome: depressive symptoms						Outcome: self-rated health					
	Model 1[a]		Model 2[a]		Model 3[b]		Model 1[a]		Model 2[a]		Model 3[c]	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Type of tenure												
Owners	1	(reference)	1	(reference)	1	(reference)	1	(reference)	1	(reference)	1	(reference)
Renters	1.47***	(1.27, 1.69)	1.44***	(1.24, 1.66)	1.26**	(1.08, 1.47)	1.47***	(1.28, 1.68)	1.46***	(1.27, 1.68)	1.38***	(1.19, 1.61)
Housing affordability												
Affordability			1	(reference)	1	(reference)			1	(reference)	1	(reference)
Unaffordability			1.20	(0.96, 1.50)	1.16	(0.91, 1.47)			1.07	(0.87, 1.33)	1.03	(0.82, 1.30)

CI, confidence interval; OR, odds ratio.
+P < 0.05, *P < 0.01, **P < 0.005, ***P < 0.001.
[a] Adjusted for age, sex, marital status, economic activity, educational attainment, place of residence, and household income.
[b] Adjusted for age, sex, marital status, economic activity, educational attainment, place of residence, household income, and depressive symptom at baseline.
[c] Adjusted for age, sex, marital status, economic activity, educational attainment, place of residence, household income, and self-rated health at baseline.

Table 3 – Interactive effects of housing tenure affordability on depressive symptoms/self-rated health.

Housing tenure and affordabiilty	Outcome: depressive symptoms						Outcome: self-rated health					
	Model 1[a]		Model 2[b]		Model 3[c]		Model 1[a]		Model 2[b]		Model 3[d]	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Tenure and affordability												
Owners with affordability	1	(reference)	1	(reference)	1	(reference)	1	(reference)	1	(reference)	1	(reference)
Owners with unaffordability	1.92***	(1.36, 2.72)	0.98	(0.70, 1.39)	1.03	(0.72, 1.48)	2.37***	(1.76, 3.17)	0.96	(0.71, 1.30)	0.96	(0.70, 1.33)
Renters with affordability	1.38***	(1.20, 1.59)	1.39***	(1.19, 1.62)	1.24**	(1.06, 1.45)	1.08	(0.96, 1.23)	1.42***	(1.23, 1.65)	1.37***	(1.17, 1.60)
Renters with unaffordability	4.77***	(3.59, 6.32)	1.93***	(1.45, 2.57)	1.56**	(1.15, 2.13)	4.42***	(3.36, 5.80)	1.70***	(1.27, 2.27)	1.51*	(1.10, 2.06)

CI, confidence interval; OR, odds ratio.
+P < 0.05, *P < 0.01, **P < 0.005, ***P < 0.001.
[a] Bivariate model.
[b] Adjusted for age, sex, marital status, economic activity, educational attainment, place of residence, and household income.
[c] Adjusted for age, sex, marital status, economic activity, educational attainment, place of residence, household income, and depressive symptom at baseline.
[d] Adjusted for age, sex, marital status, economic activity, educational attainment, place of residence, household income, and self-rated health at baseline.

explanations need to be presented. First, it is well documented that a high burden on housing expenditures limits other fundamental expenses such as health care; consequently, the inability to meet basic life needs deteriorates health.[9,10,30] However, in Korea's context, even if housing financial stress might be detrimental to health, its effects can be partially weakened or negated due to the robust impacts of homeownership. To be specific, Koreans have had an eagerness to be homeowners for a long time, and their attitudes toward ownership, which are encouraged by housing policy,[21] allow them to endure high housing expenses. Therefore, we can suggest that housing tenure, as well as housing-related expenses, is of great importance when investigating the association between housing and health.

In this sense, it is noteworthy that renters are more vulnerable to the health effects of housing unaffordability. Our study revealed that the health effects of housing affordability are moderated by housing tenure. To be specific, renters who reported having unaffordability problems have a higher likelihood of having depressive symptoms and poor self-rated health. However, homeowners, regardless of whether they have an unaffordability problem or not, did not show significant health consequences. Compositional effects are able to partially illustrate that homeowners, who are often more wealthy people, have a wide range of options for dealing with housing-related costs other than selling their own residential place, such as reducing non-housing expenditures.[31] Therefore, both emotional comforts, such as a sense of control, can be strengthened by a state of ownership. Also, alternative choices given to solve financial problems might reduce the health effects of unaffordability among homeowners.

On the other hand, with respect to renters' vulnerability to health effects, we can suggest that housing tenure can moderate the association between affordability and health, as previously explained. To be specific, renters are more vulnerable to the health effects of housing financial problems because it leads financial stress in the short run, and, in the long run, it might make it difficult for renters to purchase a home.[4] To summarize, this study states that renters are vulnerable to poor health, especially when they have to deal with high rental expenses.

Conclusion

Although the Korean government has focused on addressing housing shortages, the number of people who suffer from housing unaffordability is considerable. As a result, it is becoming hard for low- to middle-income groups to purchase a home. Our results could demonstrate that housing insecurity has a significant impact on health outcomes. Furthermore, the health effects of housing unaffordability are highly observed among renters. Limitations in this study should be noted. First, this study did not capture temporal changes of housing tenure and affordability because we only used variables measured at one time point. To demonstrate housing's causal effects on health, future studies will need to continuously analyze changes of tenure and housing expenditure as well. In addition, self-report bias might exist because participants were required to subjectively report their housing status. In spite of its weaknesses, this study could contribute empirical evidence for housing effects on health in Korea, where this is rarely considered to be a public health issues. In addition, we used a nationally representative data set to support existing arguments of housing effects on health. To prevent negative health consequences caused by housing problems, it is necessary to expand interests in housing and health. To be specific, interventions that aimed to alter tenure and its reviews are insufficient.[25] Therefore, potential interventions need to be developed to achieve health equity. Also, housing tenure should be regarded as a critical element in implementing policy to solve housing affordability.[4]

Author statements

Ethical approval

We did not need an informed consent from participants because the KOWEPS we used for analysis is a publicly available data set and can be downloaded from the website (www.koweps.re.kr).

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Competing interests

The authors have no conflicts of interest associated with the material presented in this article.

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