

Changes in Household Size and Depression: A Temporal Analysis

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Short Report

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Abstract

This study examines the relationship between changes in household size and depression through a temporal analysis using the Korean Welfare Panel Study. The number of household members at both t-1 and t year was measured and a generalized estimating equation was used. Households that increased in size after a year showed a lower prevalence of depression than the corresponding reference groups. On the contrary, when individuals from multi-person households inhabited single-person households after a year, their probability of experiencing depression increased by more than 70% in comparison to those who remained in single-person households throughout.

Introduction

A household is defined as a group of people who jointly provide food, shelter, and other necessities to each other. Household size and composition are intertwined with various socioeconomic processes, such as marriage patterns and procreation, differences in intergenerational norms, the demand for education and health care, spending priorities, and consumption patterns. Over the past few decades, the average household size has decreased in most countries, and it is common for individuals to live alone [1]. South Korea is no exception, with single-person households exceeding 30% of the total in 2020. This trend is expected to intensify in the future [2,3].

A decrease in household size is associated with health effects, particularly poor mental health and depression, in addition to several socioeconomic consequences [4,5,6]. In general, there are differences in the prevalence of depression between those living in smaller families and those in larger families [7], which indicates that people living in smaller households are more likely to have depression in comparison to those living in larger households [8]. Poor health outcomes such as depression are known to be reduced by family support, which includes emotional, material, and other tangible support mechanisms that act as buffers against mental and other illnesses by reducing one's vulnerability to health and social shocks [9].

Despite these important observations, these studies are limited as they were mainly conducted in the form of cross-sectional design in a small number of Western cultural countries. Therefore, there is a need for a study that examines the change in household size and the presence or absence of depression in a time-lined manner, especially in Asian cultures, which have not been well known about it. The purpose of this study was to examine the relationship between changes in household size and depression through a temporal analysis using panel data from a sample of the Korean population.

Methods

This study used data from the Korean Welfare Panel Study (KOWEPS)—a nationally representative panel survey of the Korean population—from 2010 to 2019. Using a multistage sampling method, households were selected for face-to-face annual surveys covering individual health, well-being, family, and socioeconomic resources [10]. For the analysis, data regarding all individuals aged 25 years or above and only observations covering two consecutive years were retained because this study conceptualized a transition of household size as happening over two years (between years t-1 and t). The final study included 99,588 cases from 15,331 subjects. Since the study used secondary data without personal identifiers, it was exempted from ethical approval by the Institutional Research Board at Ajou Medical Center (AJIRB-SBR-EXP-21-555).

The outcome variable was depressive symptoms, which were identified using the Center for Epidemiological Studies-Depression Scale (CES-D 11) [11]. The respondents were asked 11 questions about their depressive symptoms in the past week and were dichotomized as either displaying depressive symptoms (indicating a score of 16 or above) or no depressive symptoms. The main explanatory variable in this study was the change in household size.

The number of household members at both t-1 and t years was measured and then categorized into three groups: single-person households, two- or three-person households, and four-person or more households. The two-year change in these three household sizes was represented by nine combinations. Potential confounding variables that could confound the

relationship between family size and depression were included. These variables included sex, age group, education level, household income, employment status, self-esteem, and self-rated health. A generalized estimating equation (GEE) model was used to analyze the association between changes in family size and depression. All statistical analyses were conducted using SAS software version 9.4.

Results

To ensure rich inferences, the results of the same analysis are presented in different reference groups (Table 1). Compared to those who remained in single-person households, those who continued to have two or more people in their household were less likely to have depression. In addition, households that experienced an increase in household size after a year showed a lower prevalence of depression. When a two- or three-person household changed to a household of four or more persons, their probability of having depression was only 0.62 times that of the reference group. Although the change from single-person households to multi-person households was not statistically significant owing to the small sample size, they also presented a lower probability of having depression. Nevertheless, when individuals in multi-person households inhabited single-person households after a year, the probability of their experiencing depression increased by more than 70% in comparison to those who remained in single-person households throughout. However, decreasing the size of households with four or more members to two or three people did not increase their risk of presenting depressive symptoms.

These results can be understood more clearly when those who remained in a two- or three-person household for two consecutive years are taken as the reference group. Members of households of the same size as the reference group who experienced an increase in their household size after one year displayed only a 0.7 times probability of having depression, whereas the probability of depressive symptoms manifesting in the group whose household size decreased to a single-person household increased by 94%.

Compared to the group whose household contained four or more members throughout, the probability of having depression was 2.31 times and 2.19 times higher in those households whose size decreased from four or more to a single person and from two or three to a single person, respectively.

Discussion

It is known that changes in family structure can be a predictor of depression [4, 12], but the relationship between various changes in household size and depression has not been reported in detail. Unlike previous research, this study measured various changes in family size and showed their effects on depressive symptoms more dynamically. A shift from a larger family to a smaller one was shown to predict a higher probability of having depression. Previous studies that mainly targeted the elderly and children have shown similar results to ours [7, 12, 13]. However, this study can be said to be more generalizable as it covered all Korean adults. Larger families tend to provide financial, emotional, and social support to their members. In Korea, women can then share their responsibilities with their children, which is a lost benefit when the household size shrinks. Most children move to single households when they pursue a university education or a job, which are among the usual causes for increased social pressures. However, their support from family members is reduced during this period. Additionally, the loss of a spouse or migration usually offsets memories and creates gaps in people's lives that are most likely to result in depression.

This study established that those who move from smaller families to larger ones have lower rates of depression, which is consistent with Tattarini et al. [9]'s finding that larger families displayed better health. This result is attributed to the care provided by the family, which is a shielding factor against social shocks [9]. Larger households are formed when people get married, have children, or join a shared household. These events provide opportunities for members to share stories and create new memories, acquire emotional and financial support, and widen their social bubble. The sharing of roles, meals, and costs is good for individuals' mental health and reduces their chances of experiencing depression.

Staying in a household of the same size over time was not associated with depression, but the prevalence of depression was higher among those remained in a single-person household. This result is consistent with Shao et al. [8] 's finding that university students living alone displayed higher levels of depression. This result shows that even when the entire population has high depression rates, those living in single households have a higher risk of depression. Turagabeci et al. [14] identified the lack of companionship as one of the major causes of poor health among those who live alone. They cited that such individuals usually have meals alone and that most of them eat outside of their homes and reach home later than those in other family structures. The number of people living in single-person households is on the rise, and our findings reinforce the need for intervention.

One of the important limitations of this study is that it measured the presence or absence of depression, not the onset of depression, which is an outcome variable. Therefore, the results of this study could not clearly indicate a causal relationship between changes in family size and the occurrence of depression. However, this study did not fail to reveal the relationship between these two factors because it sensitively measured changes in family size.

This report reemphasizes the impact of social mobility on health outcomes and highlights the issue of depression among a growing population group: single-person households. To establish a wider understanding of this topic, we encourage more extensive studies, especially focusing on mental health outcomes, which are associated with changes in family structure.

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Declarations

- **Competing Interests;** The authors have no conflicting interests

Tables

Table 1. Association of change in household size and depression by different reference group

	Reference group		
Change in household size	Single > Single ^a	Two or three > Two or three ^a	Four or more > Four or more ^a
Singe > Single	1 (reference)	1.13(1.05-1.22)*	1.34(1.21-1.48)*
Single > Two or three	0.92(0.71-1.19)	1.04(0.81-1.34)	1.23(0.95-1.60)
Single > Four or more	0.55(0.26-1.18)	0.63(0.29-1.34)	0.74(0.34-1.58)
Two or three > Single	1.72(1.51-1.96)*	1.94(1.71-2.21)*	2.29(1.99-2.64)*
Two or three > Two or three	0.88(0.82-0.95)*	1 (reference)	1.18(1.10-1.27)*
Two or three > Four or more	0.62(0.50-0.77)*	0.70(0.57-0.86)	0.83(0.68-1.01)
Four or more > Single	1.73(1.11-2.69)*	1.96(1.26-3.05)*	2.31(1.49-3.59)*
Four or more > Two or three	0.84(0.72-0.99)*	0.95(0.83-1.10)	1.12(0.97-1.30)
Four or more > Four or more	0.75(0.68-0.83)*	0.85(0.79-0.91)*	1 (reference)

^a adjusted for sex, age group, education level, household income, employment status, self-esteem, and self-rated health