Contents lists available at Science-Gate

International Journal of Advanced and Applied Sciences

Journal homepage: http://www.science-gate.com/IJAAS.html

Factors affecting depression of participants in senior employment: Focusing on the actual status of senior employment projects and social activity support projects

Hee Young Woo, Sun-Jung Park*

Department of Nursing, Sahmyook Health University, Seoul, South Korea

ARTICLE INFO

Article history:
Received 10 March 2022
Received in revised form
22 May 2022
Accepted 14 June 2022

Keywords:
Participants in the senior employment
Subjective health
Medical expenditure
Depression

ABSTRACT

This study aims to relate subjective health and medical expenditure with depression and to secure basic data for a program to manage depression of participants in senior employment based on the surveyed relationship. This study is descriptive research to identify subjective health, medical expenditure, and depression and to examine factors of subjective health, and medical expenditure on depression of participants in senior employment. To this end, 472 people of 60 years or more participated in this study. The household data and household member data were combined based on the data for the 14th year of 2019 and the 15th year of 2020 of the Korea Welfare Panel Study. As a result of this study, participants in senior employment were depressed slightly higher than average. In general features, depression was statistically related to age, presence of partners, and residential type, Furthermore, subjective health was correlated with depression. Factors affecting depression were statistically related to subjective health status and the presence of spouses. From identifying factors affecting depression of participants in senior employment, it is necessary to develop a program to manage depression of participants in senior employment and to explore plans for welfare policy for seniors.

1. Introduction

In Korea, the current population of 65 years or more is increasing to 8.53 million in 2021, and the number of children and adolescents under the age of 14 is 8.3 million, indicating a high population of seniors. According to Statistics Korea, in 2016, the population of seniors exceeded 14% and Korea entered into an aging society in earnest. When this condition continues, about 20.8% of the total population would be seniors by 2026, entering a super-aged society (Phang et al., 2006). As the senior population increases, Korean society has social problems such as deterioration of physical function due to aging, economic instability due to unemployment, psychological contraction due to loss of social role, and alienation from culture (Kang et al., 2016). In Korea, the poverty rate of seniors aged 65 or more is 48.4%, which means about half of them are in poverty. The suicide rate among seniors was 69.8 per 100,000 people in 2019, which is four times higher than the OECD average (Park et al., 2016). The economic poverty of seniors causes depression, and it greatly affects their psychological well-being of seniors (Adams, 2011). The increase in the old population in Korea and the increase in life expectancy for seniors imply problems in how to live longer old age after retirement (Adams, 2011). In addition, as these problems become more serious, it is necessary to explore solutions to solve the poverty of seniors and lower the suicide rate in an aging society.

To this end, the senior employment projects have been implemented since 2004, which aim to contribute to the improvement of the welfare of seniors by supporting various jobs and social activities so that seniors can lead active and healthy lives in their old age. The senior employment projects gradually expanded their sizes and grew to the extent that those projects affect the national employment index. These results establish the senior employment projects as the provision of jobs for seniors (Chao et al., 2006). In the early years of old age, the researchers discovered that the desire to participate in jobs for seniors was high because they regard that they could sufficiently fulfill their role in

* Corresponding Author.
Email Address: bun8973@naver.com (S. J. Park)
https://doi.org/10.21833/ijaas.2022.09.013
Corresponding author's ORCID profile:
https://orcid.org/0000-0003-3947-5436

labor markets (Yeung and Cheung, 2015). The research also revealed that senior employment projects allow seniors to have a comfortable time for the rest of their lives, provide opportunities to enjoy hobbies and leisure activities that were not possible before retirement, and are beneficial when seniors are faced with problems, such as isolation, alienation, and economic difficulties due to loss of role, reduced income, reduced social participation, and others. According to research, for seniors, jobs not only serve as a means of earning money but also provide a sense of pride and usefulness in performing their roles (Bailis et al., 2003), which means that jobs play an important role in improving quality of life. However, in old age, it is difficult to participate in jobs for seniors due to deterioration of health, and it is confirmed that health-related medical expenditures are the highest. Generally, the subjective health status of seniors reflects their physical health (Yeung and Cheung, 2015). In fact, factors such as the inability to perform what seniors really want to do or a sense of well-being have significant impacts on their health. In other words, the health of seniors has multiple meanings, including disease.

Therefore, it is revealed that the subjective health status of seniors is an interaction of psychological and economic factors as well as physical factors. In particular, when the characteristics of old age are considered that health-impairing factors such as disease and injury are frequent and that deterioration of health and loss of adaptability are experienced with aging, In order to improve the quality of life of seniors, they need awareness of subjective health, which is a voluntary assessment of their own health (Choi, 2014). Subjective health is an important predictor of later health outcomes (Benyamini et al., 2000). It is uncovered that subjective health considers not only physical aspects but also functional level, adaptation or attitude toward disease, and feeling when seniors subjectively evaluate their health (Ha and Lee, 2017). As subjective health also affects medical expenses, it is necessary for participants in senior employment to screen their subjective health and arrange health management plans to maintain their health. Kondo et al. (2008) stated that the lack of participation in social activities of seniors was a risk factor that could lead to depression. Domènech-Abella et al. (2017) identified that the low social activity level of seniors was significantly related to depression. Seniors should complete the meaning of lives and about who they really are through jobs or role activities that are appropriate for their old ages, situations, or environment. Seniors should also overcome problems from aging. The government is obliged to arrange alternatives in order for seniors, who have contributed to national development with dedication and sacrifice, to put new meaning to their jobs and roles and to lead their lives of old ages. Previous studies on participants in senior employment projects found evaluation and development plans for the effectiveness and efficiency of projects (Choi, 2014), changes in life satisfaction of participants, mental health, satisfaction with the business, and others(Park, 2012; Clipp, 2002). However, few studies examined the relationship between subjective health, medical expenditure, and depression. This study aims to identify the relationship between subjective health, medical expenditure, and depression and to secure basic data for a program to manage depression of participants in senior employment based on the surveyed relationship.

1.1. Purpose of the study

This study aims to relate subjective health and medical expenditure with depression. Specific purposes are as follows:

- First, to identify the general characteristics of participants.
- Second, to confirm subjective health, medical expenditure, and the degree of depression of participants.
- Third, to identify differences in subjective health, medical expenditures, and depression depending on the general characteristics of participants.
- Fourth, to verify the correlation between subjective health, medical expenses, and depression of participants.
- Fifth, to confirm factors of subjective health and medical expenses on depression of participants.

2. Method

2.1. Design

This study is descriptive research to relate subjective health and medical expenditure with depression and to identify factors of subjective health and medical expenditure on depression of participants in senior employment projects.

2.2. Participants

472 people (60 years or more) participated in this study. The household data and household member data were combined based on the data for the 14th year of 2019 and the 15th year of 2020 of the Korea Welfare Panel Study. Senior employment projects are generally aimed at people over 65 years. However, people aged 60 to 64 can participate, depending on the type of project or the type of operation. Korea Welfare Panel Survey is a longitudinal survey to investigate the size and changes in household types, income levels, and employment status of the poor, including the poorest, after the financial crisis (Phang et al., 2006). It is suitable for the survey to be used in this study in that it contains information on the physical, mental health, economic status, and demographic characteristics of people over 60 years or more as well as information on household members of

participants. Participants were selected through the following steps. In Korea Welfare Panel data, the items related to income and expenditure are asked in the previous year, not in the year when the survey was conducted. Hence, this study extracted variables from the 14th year of 2019 data on attendance in senior employment in 2020, medical expenditures, property income from the previous year, and economic support received from their sons or daughters. The used variables in 2020 data were related to demographic characteristics, household characteristics, and the health status of respondents. The subjects were 472 seniors aged 60 years or more as of the 14th year of 2019 data and had experience participating in senior employment projects.

2.3. Description of variables

Subjective health status, medical expenditure, and depressions were variables in senior employment projects. A five-point Likert scale tool was used to measure subjective health status. The Likert scale tool used in this study, ranging from (5)=strongly healthy to (1)=strongly unhealthy, was reversely coded from the contents of the original data. As the total scores are higher, it can be interpreted that the subjective health status of participants are better. Items of average annual medical expenditures were only recorded with the amount of money that participants paid, such as hospitalization, outpatient, dental, surgery, medicine, nursing care, and health supplements. Lastly, Center for Epidemiologic Studies Depression Scale was used to measure depressive symptoms severity. The CESD-11 is the most widely used tool for studies on depression. The scale is an inventory of 11 self-report items and response choices are assigned point values (1~4 points). Two of the 11 items were reversely coded and the average value was used as the depression score. A higher score is interpreted to indicate a risk for depression. To measure the internal consistency reliability of the reversely coded version, Cronbach's Alpha was calculated. The result was .87.

3. Analysis of data

SPSS 24.0 program was used to process the collected data.

1. Frequency, percentage, mean and standard deviation were analyzed as descriptive statistics for general characteristics, subjective health of participants, medical expenditure, and depression.
2. T-test, ANOVA, and Scheffe test were used for differences in subjective health, medical expenditure, and depression according to general characteristics.
3. Pearson's correlation coefficient analysis was processed between two variables of subjective health, medical expenditure, and depression of participants.
4. Multiple regression analysis was performed to determine factors that influence the depression of participants.

4. Results

4.1. General characteristics

Table 1 indicates the general characteristics of participants in this study. As for gender, 117 (24.8%) were male and 355 (75.2%) were female. More females responded than males. As for educational level, 147 (88.3%) of subjects graduated from junior high school or under, which accounted for more than subjects who graduated from high school or more (11.7%). As for the age group, the number of subjects 75 years or more was 323 (68.4%), 70 years or more and less than 75 was 101 (21.4%), and 60 years or more and less than 70 was 48 (10.2%). As for the presence of a spouse, 209 (44.3%) lived with spouses. 263 (55.7%) did not have spouses. As for the presence of chronic disease, 84.7% of subjects (400) did not show the presence of chronic disease. 55.7% of subjects (263) had a chronic disease. As for residential type, 222 (47.0%) owed their houses. 250 (53%) lived in free rental houses, apartments, and others. All 472 (100%) subjects received the support of basic livelihood from the government.

Table 1: General characteristics (N = 472)

Variables		Participants in senior employment	
		Frequency	Percentage
Gender	Male	117	24.8
	Female	355	75.2
Educational level	graduated from junior high school or under	417	88.3
	graduated from high school or more	55	11.7
Age group	60 years or more and less than 70	48	10.2
	70 years or more and less than 75	101	21.4
	75 years or more	323	68.4
Presence of a spouse	Presence	263	55.7
	Absence	209	44.3
Presence of chronic disease	No chronic disease	400	84.7
	Chronic disease	72	15.3
Residential type	Owing one's house	222	47.0
	Free rental housing, Apartment, Others	250	53.0
Support for basic livelihood	Non-support	472	100.0
	Support	0	0.0

4.2. Descriptive statistics of variables

The average point of subjective health was 3.14±0.78 (out of 5 points). The average point for medical expenditures was 19.79±22.480 (minimum 0 won to 1.86 million won). The average point for depression was 1.85±0.64 (out of 3 points) (Table 2).

Table 2: Descriptive statistics of variables (N=472)

Variables	Mean	SD	Min~Max
Subjective health	3.14	.78	1~5
Medical expenditure	19.797	22.480	0~186
Depression	1.85	.64	1~3

4.3. Analysis of correlation

Table 3 presents the correlations between subjective health, medical expenses, and depression of participants. Subjective health was correlated with medical expenditure (r=.094, p<.001), and depression (r=.267, p<.001). Medical expenditure had a significantly negative correlation with depression (r=-.054, p<.047).

4.4. Subjective health, medical expenditure, depression according to general characteristics

Subjective health according to general characteristics of subjects revealed a significant difference depending on age and presence of a spouse. As for age group, subjects in the age group of 60 years or more and less than 70 had higher awareness of subjective health than those in the age group of 75 years and more and of 70 years or more and less than 75(F=4.42, p=.013). As for the presence of a spouse, subjective health was perceived to be higher in the presence of a spouse than in the absence of a spouse (t=0.66, p<.040). Medical expenditures according to general characteristics of subjects showed a significant difference depending on gender, educational level, presence of a spouse, and residential type. As for gender, males expended more on health care than females (t=14.77, p<.001). As for educational level, subjects who graduated from high school or more spent more money on medical expenses than those who graduated from junior high school or under (t=28.27, p<.001). As for the presence of a spouse, it was recognized that medical expenditure was higher when subjects lived with a spouse (t=25.18, p<.040), As for residential type, when subjects lived in free rental houses, apartments, and others, they spent more money on medical expenditure, compared to subjects who had their own houses. Depression according to general characteristics of subjects indicated a significant difference depending on gender, presence of a spouse, and residential type (t=34.63, p<.001). As for gender, a male was more depressed than a female (t=8.51, p<.001). As for residential type, when subjects had their own houses, they were more depressed, compared to subjects who lived in free rental houses, apartments, and others (t=8.51, p<.001) (Table 4).

Table 3: Analysis of correlation (N=472)

Variables	Subjective health	Medical expenditure	Depression
Subjective health	1	.094(<.001)	.267(<.001)
Medical expenditure		1	-.054(.047)
Depression			1

Table 4: Subjective health, medical expenditure, depression according to general characteristics (N=472)

Variables		Subjective health			Medical expenditure			Depression		
		M±SD	t/F	p	M±SD	t/F	p	M±SD	t/F	p
Gender	Male	2.91±.82	.010	.920	26.47±29.65	14.77	<.001	1.72±.22	8.51	.004
	Female	3.22±.75			17.59±317.09			1.84±.30		
Educational level	graduated from junior high school or under	3.17±.77	.399	.528	18.64±19.21	28.72	<.001	1.82±.29	.513	.474
	graduated from high school or more	2.93±.86			28.50±38.42			1.73±.27		
Age group	60 years or more and less than 70	3.23±.77	4.42	.013	18.22±18.66	.130	.878	1.82±.27	1.04	.353
	70 years or more and less than 75	2.94±.81			20.03±21.82			1.77±.30		
	75 years or more	3.20±.77			19.95±23.23			1.82±.28		
Presence of a spouse	Absence	3.13±.78	.066	.040	14.01±18.64	25.18	<.001	1.86±.30	5.05	.025
	Presence	3.16±.78			27.07±24.71			1.74±.26		
Presence of chronic disease	No chronic disease	3.38±.744	21.84	.700	17.52±14.35	.72	.460	1.87±.33	.70	.480
	Chronic disease	2.00±.01			7.00±.01			1.63±7.91		
Residential type	Owning one's house	3.15±.76	.056	.813	13.55±15.38	34.63	<.001	1.87±.30	17.39	<.001
	Free rental houses Apartment, Others	2.14±.78			26.08±1.64			1.76±.26		

4.5. Regression analysis

In order to infer causal relationships between variables affecting depression of participants in senior employment projects, regression analysis was conducted with subjective health, medical expenditure, and the presence of a spouse. The result is shown in Table 5. To discover variables that affect depression, the presence of a spouse from general characteristics showed a significant difference in depression. The presence of a spouse was designated as a control variable. It was treated as a dummy variable and then analyzed. To conduct regress analysis, multicollinearity between autocorrelation of the dependable variable and the independent variable was calculated. Durbin-Watson's value was

1.74. Hence, a dependable variable was independent of autocorrelation. VIF value was 1.02~1.10, which was under 10. Hence, it was determined that there was no multicollinearity. As a result of multiple regression analysis, subjects felt more depressed when the subjects had higher subjective health awareness (β=14, p<001), and when those subjects lived without a spouse (β=-.177 p<.023). As for the relative importance of variables influencing depression, subjective health (β=32) was the highest. The presence of a spouse (β=.26) was followed. R square of those variables was 12.1% (Table 5).

Table 5: Regression analysis

	Unstandardized coefficient		Standardized coefficient	t	Significance probability	Collinearity Statistics	
	B	Standard error	β			Tolerance	VIF
Constant	1.464	.170		8.586	.000		
Subjective health	.143	.050	.322	2.857	.006	.976	1.025
Medical expenditure	.000	.001	-.017	-.366	.714	.908	1.101
Presence of a spouse	-.177	.076	-.261	-2.319	.023	.976	1.025

F=5.878; p=.004; R^2=.146; adj-R^2 =.121

5. Discussion

This study aimed to identify the effects of participating in senior employment projects on depression, analyze whether participation in senior employment projects affects subjective health and medical expenditure on depression, and explore measures for developing programs for depression management of participants in senior employment projects and welfare policy for seniors. As for general characteristics, depression points of participants in senior employment projects depended on gender, presence of a spouse, and residential type. Park and Kim (2011) examined that were 1.7 times more likely to develop a risk for depression than men. This study also examined that women had significantly higher depression points than men. This result was similar to that of Park and Kim (2011). These results would be based on the characteristics of Korean culture. Compared to male seniors, female seniors live in disadvantaged conditions in Korean society. It is regarded that depression points of female seniors were higher due to influences such as lack of social opportunities and differences in roles between men and women.

This study confirmed that there was a significant difference in the depression points according to the presence of a spouse. Park and Kim (2011) also confirmed that depression points were higher when senior lives alone than when a senior lives with other family members in their study. Both studies had similar results. Subjects showed more depression when they lived in free rental houses, apartments, and others, compared to when they owed their houses. Few studies have been conducted on depression points based on residential type. It is difficult to compare the result of this study to that of other studies. Hence, it is necessary to confirm depression points according to residential type from repeated studies in the future. Continuous studies are required to be conducted on increasing seniors in the theme of difference in depression points for gender, presence of a spouse, and residential type based on general characteristics. Old age is a vulnerable period to depression due to various physical and psychosocial factors such as economic difficulties, social isolation, and functional decline. These factors can increase depression points. Therefore, it is necessary to explore and study major variables to reduce depression. This study identified that there was a statistically significant positive correlation between subjective health status and depression, which means that perceived subjective health status by seniors is closely related to depression. Kim and Kweon (2010) also identified that seniors who use medical welfare facilities for the aged are experiencing depression and reported that their quality of life declined due to depression. Kang (2009) also confirmed that depression was lower and quality of life was higher when seniors perceived themselves to be healthy. The results were similar to those of this study. Seniors recognize that their health is getting worse. It is considered that health status is closely related between depression and quality of life. It is necessary to develop and supply various programs related to improving health in old age and overcoming depression in order for participants in senior employment projects to have a positive perception of their subjective health status and to lower depression. Subjective health status was the most influential factor in depression of participants in senior employment projects. The presence of the spouse was followed. In studies by Kim and Kweon (2010) and Tsai et al. (2008), subjective health status was identified as a factor that directly affects the depression of seniors who live in medical welfare facilities for the aged. Their results are similar to the result of this study. Seniors are in vulnerable health conditions. With the results of this study, it is necessary to periodically select a depression risk group of participants in senior employment projects and to develop and apply programs to alleviate depression and enhance subjective health status awareness for seniors. It is necessary to expand support systems in the local community to effectively mediate the depression of participants in senior employment projects. It is also necessary to develop emotional support programs to manage depression while carrying out employment projects. With these suggestions, when seniors perceive their subjective health status positively and are managed to prevent depression, the physical,

mental health, and quality of life of participants in senior employment projects would be improved.

With these results, limitations of this study and directions for future studies are suggested. This study has two limitations in that the secondary data analysis was conducted with cross-sectional data called 'Survey on the Actual Status of Senior Employment Projects.' Firstly, the analysis was performed with only the items presented in the actual status survey. Hence, there is a limitation in not securing diversity in the details of variables and the composition of concepts. Secondly, problems such as distortion of relationships between variables may exist in that it was based on the subjective perception of subjects. It is because a self-report questionnaire was used for the survey. Therefore, it is expected that continuous studies would be conducted on various variables that affect depression in participants in senior employment projects with rapid aging and the increase in life expectancy. Specific studies should be conducted on various methods to improve the development of programs for relieving depression and improving the subjective health status of seniors in an aging society.

6. Conclusion

As a result of this study, participants in senior employment were depressed slightly higher than average. In general characteristics, depression was statistically related to age, presence of a spouse, and residential type, Furthermore, subjective health was correlated with depression. Factors affecting depression were statistically related to subjective health status and the presence of a spouse. From the identification of factors affecting depression of participants in senior employment projects, this study aimed to explore measures for developing programs for depression management of participants in senior employment projects and welfare policy for seniors.

Education and support are required to help seniors perceive their health status positively and to help prevent depression by enhancing various support systems. Furthermore, senior employment projects allow participants not only to make a living to old ages but also to live healthy lives by voluntarily participating in projects. Therefore, more job employment programs should be arranged.

Compliance with ethical standards

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

References

Adams KB, Leibbrandt S, and Moon H (2011). A critical review of the literature on social and leisure activity and wellbeing in later life. Ageing & Society, 31(4): 683-712. https://doi.org/10.1017/S0144686X10001091

Bailis DS, Segall A, and Chipperfield JG (2003). Two views of self-rated general health status. Social Science and Medicine, 56(2): 203-217. https://doi.org/10.1016/S0277-9536(02)00020-5

Benyamini Y, Idler EL, Leventhal H, and Leventhal EA (2000). Positive affect and function as influences on self-assessments of health: Expanding our view beyond illness and disability. The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 55(2): P107-P116. https://doi.org/10.1093/geronb/55.2.P107 **PMid:10794189**

Chao SY, Liu HY, Wu CY, Jin SF, Chu TL, Huang TS, and Clark MJ (2006). The effects of group reminiscence therapy on depression, self esteem, and life satisfaction of elderly nursing home residents. Journal of Nursing Research, 14(1): 36-45. https://doi.org/10.1097/01.JNR.0000387560.03823.c7 **PMid:16547904**

Choi SG (2014). A study on the impact of resilience on the quality of life for senior citizens and the inter-mediated effects of the social participation and depression. Ph.D. Dissertation, Han Sei University, Gunpo, South Korea.

Clipp EC (2002). Quality of life in the encyclopedia of aging, Maddox. Springer Publishing Co., New York, USA.

Domènech-Abella J, Lara E, Rubio-Valera M, Olaya B, Moneta MV, Rico-Uribe LA, Ayuso-Mateos JL, Mundó J, and Haro JM (2017). Loneliness and depression in the elderly: The role of social network. Social Psychiatry and Psychiatric Epidemiology, 52(4): 381-390. https://doi.org/10.1007/s00127-017-1339-3 **PMid:28154893**

Ha JK and Lee S (2017). The effect of health-related habitual consumption and lifetime on subjective health of one person households: Focusing on comparison between non-one person households and generations. Family and Environment Research, 55(2): 141-152. https://doi.org/10.6115/fer.2017.011

Kang ET, Kang JK, and Ma KR (2016). Subjective well-being of one-person households: Focus on non-married and married one-person households. Journal of Institute for Social Sciences, 27(1): 3–23. https://doi.org/10.16881/jss.2016.01.27.1.3

Kang SK (2009). The effects of self-efficacy and social support on the quality of life of the elderly with depression. Journal of the Korean Gerontological Society, 29(2): 629-643.

Kim M and Kweon YR (2010). Predictors of depression in residents of geriatric medical and welfare facilities. Journal of Korean Academy of Psychiatric and Mental Health Nursing, 19(2): 212-219. https://doi.org/10.12934/jkpmhn.2010.19.2.212

Kondo N, Kazama M, Suzuki K, and Yamagata Z (2008). Impact of mental health on daily living activities of Japanese elderly. Preventive Medicine, 46(5): 457-462. https://doi.org/10.1016/j.ypmed.2007.12.007 **PMid:18258290**

Park BY, Kwon HJ, Ha MN, and Burm E (2016). A comparative study on mental health between elderly living alone and elderly couples-focus on gender and demographic characteristics. Journal of Korean Public Health Nursing, 30(2): 195-205. https://doi.org/10.5932/JKPHN.2016.30.2.195

Park JH and Kim KW (2011). A review of the epidemiology of depression in Korea. Journal of the Korean Medical Association, 54(4): 362-369. https://doi.org/10.5124/jkma.2011.54.4.362

Park YS (2012). A study on determinants affecting continuity of activity among participants in job creation project for older adults-focused on market oriented type. M.Sc. Thesis, University of Seoul, Seoul, South Korea.

Phang CW, Sutanto J, Kankanhalli A, Li Y, Tan BC, and Teo HH (2006). Senior citizens' acceptance of information systems: A study in the context of e-government services. IEEE Transactions on Engineering Management, 53(4): 555-569. https://doi.org/10.1109/TEM.2006.883710

Tsai YF, Wong TK, Tsai HH, and Ku YC (2008). Self-worth therapy for depressive symptoms in older nursing home residents. Journal of Advanced Nursing, 64(5): 488-494. https://doi.org/10.1111/j.1365-2648.2008.04804.x **PMid:19146517**

Yeung WJJ and Cheung AKL (2015). Living alone: One-person households in Asia. Demographic Research, 32: 1099-1112. https://doi.org/10.4054/DemRes.2015.32.40