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Impact of older adults' mobility and social participation on life satisfaction in South Korea

Samsik Lee[1] | Hyojin Choi[2]

[1]Hanyang University, Seongdong-gu, Korea

[2]Aging Society Research Institute at Hanyang University, Seongdong-gu, Korea

Correspondence
Samsik Lee, Hanyang University, 316, HIT, 222, Wangsimni-ro, Seongdong-gu, Seoul 04763, Korea.
Email: lss2323@hanyang.ac.kr

Abstract

South Korea has been experiencing rapid population aging. In an aging society, the need for healthy lives is greater. Two of the fundamental factors to enable independent and active life for the elderly are mobility and social participation. The purpose of this study was to examine the relationship between older adults' mobility, social participation, and quality of life in South Korea. We used data from the 2017 National Survey of Older Koreans conducted by the Ministry of Health and Welfare and the Korea Institute for Health and Social Affairs and applied hierarchical regression. The major finding was that older adults' mobility had a positive impact on their life satisfaction. After controlling for older adults' mobility, social participation was positively associated with life satisfaction regardless of the place of residence. The findings of this study not only make a valuable contribution to further research on mobility and social participation but also provide new insight into improving older adults' quality of life.

KEYWORDS
life satisfaction, mobility, social participation

1 | BACKGROUND

South Korea has been experiencing rapid population aging. The proportion of the population aged 65 and over has increased from 3.1% in 1970 to 14.3% in 2018 (Statistic Korea, 2019). This proportion is projected to increase to 20.3% in 2025, 30.5% in 2036, and 40.2% in 2051 (Statistic Korea, 2019). Specifically, the number of oldest persons will rapidly increase with decreasing future mortality rates.

In an aging society, the need for healthy lives is greater. In the future, older adults will be wealthier, healthier, and better educated than ever before. As a result, the demands for independent and active lives will increase. Mobility and social participation could be important factors to enable independent and active life for the elderly. But, a lot of older adults are experiencing mobility limitations. According to the 2017 National Survey of Older Koreans, 48.3% of older adults reported that they experienced difficulties in going up- and downstairs or a slope, 31.0% reported that they had difficulties in boarding and alighting from buses or subways, and 9.9% reported that they experienced difficulties in going out due to lack of transportation means (Jung et al., 2017). Also, they tend to limit social engagements and activities. For example, participation rates in lifelong education and volunteer work were only 12.9% and 3.9%, respectively. Leisure and culture activities in which older adults desired to engage were mostly related to inactive activities such as watching TV (45.6%).

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Mobility limitation will lead to older adults' social exclusion or social isolation (Fonda, Wallace, & Herzog, 2001; Li & Loo, 2017; Marottoli et al., 2000; Rosso, Taylor, Tabb, & Michael, 2013). Decreasing social participation will have a negative impact on various aspects of their life. There were a lot of studies to attempt to measure mobility and identify the relationship between mobility, social participation, and life satisfaction in Western countries. For example, von Bonsdorff, Rantanen, Laukkanen, Suutama, and Heikkinen (2006) showed that mobility limitation and cognitive disorder had negative impacts on the possibility for older adults to live at home. Hirvensalo, Rantanen, and Heikkinen (2000) found that the risk of death was greater in impaired mobility groups than the mobile-active group.

However, there were a few studies that try to comprehensively understand the relationship between mobility, social participation, and life satisfaction in Asian countries. Li and Loo (2017) revealed that mobility impairment of seniors was indirectly related to life satisfaction via social engagement in China. Jang, Park, and Lee (2009) found that mobility of elderly with driving had positive relationship with psychological well-being in South Korea. However, in this study, the sample was only collected from senior drivers who live in specific area by convenience sampling. Hwang, Kim, and Oh (2017) revealed that elderly driver tended to participate more in social activities and showed lower levels of depression than elderly who did not drive by using national representative data in South Korea. Although mobility would be a critical issue for elderly in not only rural areas but also metro cities, this study focused on the elderly in rural areas. Above all thing, mobility in these studies was only measured by using indicator about driving.

The purpose of this study was to investigate the relative importance of the mobility and social participation as predictors of life satisfaction. We proposed two main hypotheses. First, we hypothesized that mobility has positive effects on older adults' quality of life by supporting their independence. Second, we hypothesized that social participation would contribute significant variance to older adults' quality of life beyond the variance already explained by mobility.

2 | DATA AND METHODOLOGY

2.1 | Data

For this study, we used data from the 2017 National Survey of Older Koreans (NSOK) conducted by the Ministry of Health and Welfare and the Korea Institute for Health and Social Affairs. The NSOK was collected every three years to understand the demands and living conditions of adults aged 65 years old and over. The first survey was conducted in 2008. The 2017 NSOK's sampling frame was based on 90 percent of the 2010 Population and Housing Census and stratified by two stages of 17 provinces, urban (Dong) and rural (Eup, Myon). The sampling framework was designed to target adults aged 65 years old and over living in areas across South Korea. To avoid the risk of underestimating sample units from rural areas, the sample was allocated by square roots of the numbers of old adults living in specific areas (Chung, 2018). In total, 10,299 elderly persons from 934 enumeration districts were interviewed directly by the trained enumerators. For the analysis, the sample excluded 460 cases (2.3% of respondents) with missing values for the dependent variable. Thus, 9,839 elderly persons were included in our analysis. We received approval from the University's Institutional Review Board (IRB; IRB Protocol Number: HYU-2019-02-021).

2.2 | Variables

The dependent variable was life satisfaction. In the 2017 NSOK, respondents were asked the quality of life questions with six items: "To what extent are you satisfied with the following parts of life?" on a scale from 1 (very satisfied) to 5 (not satisfied at all). The six items were as follows: (1) health status; (2) economic status; (3) relationship with spouse; (4) relationship with child; (5) social, leisure, and cultural activities; and (6) relationship with friends and regional society. We included only five items of satisfaction, all except for relationship with spouse, since the portion of the elderly without a spouse accounted for 36.1%. We recoded each item and summed to measure life satisfaction. Higher scores indicated higher levels of life satisfaction.

We measured mobility in three areas: physical ability to move, ability to independently use transportation, and ability to drive. Physical ability to move was measured by using a question: "How difficult is it when carrying out the following actions?" on a scale from 1 (not difficult at all) to 4 (impossible). There were two items related to mobility: (1) walking a lap around a field (400 m) and (2) walking 10 steps up without resting. We recoded and summed the items so that higher scores equated to higher physical ability to move. Ability to independently use transportation was measured by using a question: "How much help from others did you need to carry out the following actions over the past 1 week?" on a scale from 1 (completely independent) to 4 (need help completely). There were 10 domains and we used one, using means of transportation (public transportation, personal vehicle). The score was recoded so that higher scores equated to a higher ability to independently use transportation. Driving was measured by using one question, "Do you currently drive?" Respondents who answered "yes" were considered to be current drivers. Respondents who answered "used to but not now" or "never in my life" were classified as non-drivers.

Social participation was defined as formal or informal activities outside their house with others without any monetary remuneration. Based on such a definition, social participation was measured using questions, "Have you participated in activities over the past 1 year?"

(1 = yes, 0 = no). The activities included were as follows: (1) learning and studying activities (except for online lecture), (2) social club, and (3) volunteering.

We included several control variables which impact on life satisfaction on the basis of previous studies: place of residence (1 = urban, 0 = rural), gender (1 = female, 0 = male), age, education (no formal education, elementary school graduate, middle school graduate, and high school graduate and over), marital status (1 = without spouse, 0 = with spouse), employment status (1 = unemployed, 0 = employed), and logged household income. We also included the respondent's subjective health status. In the 2017 NSOK database, the respondents were asked, "What do you think of your health status?" on a scale from 1 (very healthy) to 5 (in very ill health). The score was recoded so that higher scores represent higher levels of subjective health status.

2.3 | Data analysis

Hierarchical regression was conducted to examine relationships between mobility, social participation, and life satisfaction for older adults. We added the variables to the model in stages. In the first step, demographic and socioeconomic variables were entered. In the second step, three variables for mobility were entered. In the third step, three variables for social participation were entered. We calculated the change in R^2.

3 | RESULTS

3.1 | Descriptive data

Sociodemographic characteristics of the sample are presented in Table 1. 68.5% of older adults reported living in an urban area. The sample consisted of 42.7% male and 57.3% female participants. The mean age was 73.90 years. Older adults with only an elementary school education accounted for 34.4% of the sample, and 25.1% of older adults were high school graduates and over. In total, 64.7% of older adults had a spouse and 31.3% of older adults were employed. The average household income was 2,605 (*SD* = 2,255) ten thousand won. The average subjective health status was 2.95 (*SD* = 0.98) out of 5. There were some differences between older adults in urban and rural areas.

Table 2 reports descriptions for mobility, social participation, and life satisfaction of the sample. Older adults reported physical ability to move score of 6.98 (*SD* = 1.41) out of 8. The scores of physical mobility were 7.03 for older adults in urban areas and 6.88 in rural areas,

TABLE 1 Sociodemographic characteristics

	Whole		Urban		Rural	
Variables	**% or mean (*SD*)**	***N***	**% or mean (*SD*)**	***N***	**% or mean (*SD*)**	***n***
Place of residence						
Urban	68.5	6,739	–	–	–	–
Rural	31.5	3,100	–	–	–	–
Gender						
Male	42.7	4,202	42.5	2,867	43.1	1,336
Female	57.3	5,637	57.5	3,872	56.9	1,765
Age (years)	73.90 (6.53)	9,839	73.70 (6.49)	6,739	74.34 (6.63)	3,100
Educational level						
No formal education	23.6	2,324	20.2	1,364	31.0	960
Elementary school graduate	34.4	3,381	32.1	2,161	39.3	1,219
Middle school graduate	16.9	1,666	18.4	1,243	13.6	423
High school graduate and over	25.1	2,468	29.2	1,970	16.1	498
Marital status						
With spouse	64.7	6,361	64.1	4,322	65.8	2,039
Without spouse	35.3	3,478	35.9	2,417	34.2	1,061
Employment status						
Employed	31.3	3,079	24.4	1,642	46.4	1,437
Unemployed	68.7	6,760	75.6	5,097	53.6	1,663
Household income (10,000 won)	2,604.57 (2,254.8)	9,839	2,785.17 (2,426.4)	6,739	2,212.07 (1,764.7)	3,100
Subjective health status	2.95 (0.98)	9,839	2.96 (0.98)	6,739	2.94 (0.99)	3,100

respectively. The score of ability to independently use transportation was 3.84 (*SD* = 0.45) out of 4. The majority (80.7%) were non-drivers. The portion of older adults who participated in lifelong education over the last year was 13.0%. The participation rate in social clubs and volunteering was 4.5% and 3.9%, respectively. The scores of life satisfaction were 16.37 (*SD* = 3.05) for older adults in urban and 16.60 (*SD* = 2.78) in rural areas, respectively.

3.2 | Impact of mobility on life satisfaction

Table 3 presents the results of the hierarchical regression analysis. Sociodemographic control variables were entered at the first step. These predicted 35.2% of the variability in life satisfaction (R^2 = 35.2%, adjusted R^2 = 35.1%, F = 533.4, p < .001). Specifically, except for age, all demographic control variables had significant effects on life satisfaction. At the second step, three variables for mobility, physical ability to move, the ability to independently use transportation, and driving were entered after controlling for sociodemographic variables (change in R^2 = 3.5%, change in F = 186.6, p < .001). In particular, a higher level of physical ability to move and ability to independently use transportation was associated with higher scores on life satisfaction. Drivers were rated as having higher levels of life satisfaction than non-drivers. To create the entire model, three social participation variables were entered (change in R^2 = 1.6%, change in F = 89.6, p < .001). Older adults who participated in lifelong education, social clubs, and volunteering programs were rated as having higher levels of life satisfaction than non-participants.

Given the situation that rural older adults tend to live in isolated areas and face mobility limitations or participation restrictions, we tested separately in urban (Model 2) and rural areas (Model 3). As presented by Model 1, three variables for mobility, physical ability to move, ability to independently use transportation, and driving, significantly contributed to life satisfaction of urban and rural older adults (change in R^2 = 3.8% and 2.9%, change in F = 147.8 and 43.8, respectively; p < .001). At the last step, participation in lifelong education, social clubs, and volunteering programs was significantly related to life satisfaction for both urban and rural older adults (change in R^2 = 1.7% and 1.3%, change in F = 68.4 and 20.5, respectively; p < .001).

4 | CONCLUSION AND DISCUSSION

This study examined the influence of older adults' mobility and social participation on life satisfaction in South Korea. The major finding was that older adults' mobility (physical ability to move, ability to independently use transportation, and ability to drive) had a positive impact on their life satisfaction consistent with the previous studies (Bonsdorff et al., 2006; Fonda et al., 2001; Hirvensalo et al., 2000; Hwang et al., 2017; Jang et al., 2009; Li & Loo, 2017; von Marottoli et al., 2000). The contribution of mobility to life satisfaction was slightly larger among urban older adults than rural older adults, but mobility was important for better lives of both urban and rural older adults. In particular, driving was prominently related to life satisfaction for the urban older adults; on the other hand, physical mobility was prominently related to life satisfaction for the rural older adults. This finding was not consistent with our expectation that driving would be more important in rural areas due to the long distance between residents and services and poor public transportation (Kostyniuk, St Louis, Zanier, Eby, & Molnar, 2012; Mattson, 2011). Rural older adults may tend to live closer to work and to be self-sufficient, not needing to travel to other areas frequently. Also, urban older adults may prefer to travel by driving than using public transportation because of problems or inconvenience when using public transportation (Mattson, 2011).

TABLE 2 Mobility, social participation, and life satisfaction of older adults

		Whole		Urban		Rural	
		% or mean (*SD*)	*N*	% or mean (*SD*)	*n*	% or mean (*SD*)	*n*
Mobility	Physical ability to move	6.98 (1.41)	9,839	7.03 (1.39)	6,739	6.88 (1.45)	3,100
	Ability to independently use transportation	3.84 (0.45)	9,839	3.83 (0.46)	6,739	3.86 (0.43)	3,100
	Driving						
	Non-driver	80.7	7,939	81.7	5,508	78.4	2,430
	Driver	19.3	1,900	18.3	1,230	21.6	670
Social participation	Lifelong education	13.0	1,277	13.2	890	12.5	387
	Social club	4.5	442	4.6	311	4.2	131
	Volunteering	3.9	386	4.0	272	3.7	114
Life satisfaction		16.44 (2.97)	9,839	16.37 (3.05)	6,739	16.60 (2.78)	3,100

TABLE 3 Results of hierarchical regression analysis for variables predicting life satisfaction

	Whole (Model 1)			Urban (Model 2)			Rural (Model 3)		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
	β	*B*	*B*	*β*	*B*	*β*	*β*	*β*	*β*
Rural (urban = ref.)	0.076***	0.072***	0.070***						
Female (male = ref.)	0.070***	0.125***	0.105***	0.073***	0.135***	0.114***	0.053**	0.092***	0.077***
Age	0.005	0.084***	0.084***	−0.004	0.076***	0.077***	0.024	0.096***	0.094***
Educational status (no formal education = ref.)									
Elementary school	0.064***	0.055***	0.051***	0.083***	0.073***	0.070***	0.041*	0.034	0.028
Middle school	0.074***	0.060***	0.051***	0.083***	0.071***	0.060***	0.075***	0.061**	0.057**
High school and over	0.133***	0.099***	0.079***	0.156***	0.121***	0.099***	0.076***	0.050*	0.037
Marital status (with spouse = ref.)									
Without spouse	−0.036***	−0.033***	−0.036***	−0.036**	−0.030**	−0.032**	−0.032	−0.032	−0.037*
Employment status (Employed = ref.)									
Unemployed	−0.019*	0.006	0.003	0.000	0.021*	0.016	−0.080***	−0.048**	−0.046**
Logged household income	0.181***	0.174***	0.172***	0.205***	0.193***	0.191***	0.102***	0.107***	0.103***
Subjective health status	0.490***	0.409***	0.403***	0.496***	0.411***	0.405***	0.471***	0.401***	0.398***
Physical ability to move		0.133***	0.125***		0.118***	0.111***		0.166***	0.156***
Ability to independently use transportation		0.100***	0.096***		0.110***	0.105***		0.064***	0.063***
Driver (non-driver = ref.)		0.101***	0.086***		0.126***	0.109***		0.045*	0.032
Social participation (no = ref.)									
Lifelong education			0.091***			0.093***			0.075***
Social club			0.049***			0.054***			0.040*
Volunteering			0.057***			0.053***			0.066***
F	533.4***	476.6***	414.5***	458.4***	403.2***	346.0***	143.2***	122.8***	104.2***
R^2	0.352	0.387	0.403	0.380	0.418	0.436	0.294	0.323	0.336
Adj R^2	0.351	0.386	0.402	0.379	0.417	0.434	0.292	0.321	0.333
ΔR^2		0.035	0.016		0.038	0.017		0.029	0.013
ΔF		186.6***	89.6***		147.8***	68.4***		43.8***	20.5***
N	9,839			6,739			3,100		

Note: The collinearity tests indicated that the data met the assumption of no multicollinearity.
*$p < .05$.
**$p < .01$.
***$p < .001$.

After controlling for older adults' mobility, the results indicated that social participation was positively associated with life satisfaction regardless of the place of residence. This finding is concordant with previous studies that demonstrated that social engagement was associated with a higher level of life satisfaction (An & Lim, 2014; Hur & Cho, 2017; Ju, 2011; Park, Park, & Yum, 2015). These findings support the importance of social activities for older adults to have better lives.

This study has several implications for South Korea in which aging will be accelerated in the future. One implication is related to support mobility for older adults. As the number of older adults increases with rises in life expectancy, maintaining mobility of older adults may be a critical issue for the near future. However, there have been few attempts to examine and understand older adults' mobility, and these studies measured mobility as the ability to drive (Hwang et al., 2017; Jang et al., 2009) in Korea. In this study, we defined mobility in a broad way, and our findings suggest that not only driving but also the physical ability and access to transportation are important for older adults. Mobility impairments would decrease the opportunities to participate in diverse social activities. Thus, a multidisciplinary approach in studying older adults' mobility needs, measurement of mobility, and barriers to mobility is needed. Public programs which can improve physical ability to move and assist older adults with mobility impairment should be developed. Since a lot of programs are suitable for middle-aged people or healthy people, mild exercise or low-impact exercise should be developed for older adults. Public transportation services to improve access to community activities, such as dial-a-ride transit and reimbursement programs, will be helpful for older adults. To create mobility-supporting environments can be considered. In specific, creating pedestrian-friendly communities or removing barriers will allow older adults to move safely to another place.

Another implication relates to the program of social activities. In South Korea, older adults tend to work longer because of immature pension system and their social participation show low level compared with other countries (Um, Zaidi, & Choi, 2019). Above all, there are few opportunities to participate in social activities, lifelong education, or volunteer programs. To support social participation of older adults, community-based initiatives with free transportation or community visiting service offering a wide range of programs should be developed. Developing programs based on older adult's unique needs or diverse characteristics would induce more participation. In addition, developing home devices to keep in touch with others continually would be useful for older adults who have difficulties to move or live in remote areas.

This study has several limitations. Although we tried to measure diverse aspects of mobility, we could not capture all aspects, such as access to transportation and the use of mobility auxiliaries, because the NSOK database did not include this information. Second, the measure of social participation in our study mainly focused on whether or not older adults participate in each type of activity. However, degrees of social participation, such as the number of hours spent in those activities, can be associated with life satisfaction; thus, future studies should be designed to measure diverse aspects of social participation.

Despite the aforementioned limitations, the findings of this study not only make a valuable contribution to further research on mobility and social participation but also provide new insight into improving older adults' quality of life.

CONFLICT OF INTEREST

All authors declare that there is no conflict of interest.

ORCID

Samsik Lee https://orcid.org/0000-0001-5986-539X
Hyojin Choi https://orcid.org/0000-0002-1373-9790

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