Influence of Socioeconomic Status and Family Support on Disability, Depressive Symptoms, and Perceived Poor Health in Older Korean Adults

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Abstract

This purpose of this study is to identify factors associated with older Korean adults' disability, depressive symptoms, and perceived poor health, with a focus on their socioeconomic status and family support. This is a secondary data analysis of the initial survey data from a home visiting center in 2009. The data were analyzed using frequencies, percentages, and multivariate logistic regression. We observed significant differences in perceived health between men and women based on their socioeconomic status. Type of medical insurance was strongly associated with depressive symptoms among the men and women. Results also indicated that being unschooled was significantly related to perceived poor health among women. Family support also influenced their health status, particularly their depressive symptoms. This study suggests that interventions for reducing health inequalities should target older adults with Medicaid and have poor family support, taking a gender-specific approach.

Keywords: aged, socioeconomic status, health status, disparities, sex, family

The Korean government created the fourth Health Plan (2016-2020) to extend disability-adjusted life expectancy and to assure equality in health (Ministry of Health and Welfare [MHW], 2015, p. 34). The MHW, which has strategic oversight of health service delivery, is responsible for providing and protecting the health of citizens in Korea. Through this, the Korean government provides home visiting care services at no cost to adults aged 65 years and older (older adults; MHW, 2017, p. 10). Home visiting care is a program in which health care professionals visit one's home or facility to directly provide health services or connect him or her to other services in order to improve their self-care ability and health (MHW, 2017, p. 17). This is an ongoing and comprehensive program aimed towards reducing health inequalities that improve accessibility to health care services for vulnerable populations.

Korea is a rapidly aging society. Nearly 14% of the population is aged 65 years and older, and thus it is predicted that Korea will become an aged society (approximately 7,070,000 people) by 2021, and a super high-aged society by 2026, where older adults will comprise 20% of the entire population (around 12,010,000 people; Statistics Korea, 2015). However, there are limited workforce and resources for providing home visiting care services for those 65 years and older at no cost. Therefore, it is important to identify those who need care first and provide them with these services to assure equality in health.

Recently, there has been a growing interest for equality in health care in Korea (Grundy & Holt, 2001; Khang, Lynch, & Kaplan, 2004; Kim, 2012; Woo & Yoon, 2001). It has been reported that education level and economic status have a strong influence on the health statuses of older adults (Avlund et al., 2003; Grundy & Holt, 2001; Jang, 2013). Thus, it is necessary to look at the relationship between socioeconomic factors and the health statuses of vulnerable older adults to find a way to assure equality in health in Korea.

With many senior citizens living with their families and getting help from them, support from families can be an important factor of equality in health in Korea (Lee & Kim, 2013). However, family support for older adults may be weakened due to their partner's death or their children leaving home. In addition, their social relationships may be reduced as they

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retire. Consequently, older adults may be more likely to face inequalities related to health. Although family support is an important factor that influences the health statuses of older adults, only a few studies have considered it significant to study? (Kim & Won, 2011; Oh & Ko, 2015).

Therefore, the purpose of this study was to examine differences in the health statuses of Korean men and Korean women aged 65 years and older, with a focus on socioeconomic factors and family support. The results of this study can provide home visiting care providers with a strategy for prioritizing and providing their services while improving equality in health care among vulnerable older adults.

Methods

Study Design and Sample

This study was a secondary analysis of data collected by visiting nurses in a home visiting center on older Korean adults in 2009. The participants were 65 years and older and were registered with a home visiting care service in *J*-gu, *S*-si, Korea. We received approval from the home visiting center and the ethics review board of the University to which the researcher was affiliated to use this data.

The predetermined sample size was based on Peduzzi, Concato, Kemper, Holford, and Feinstein's (1996) calculation. In a logistic regression model, p is the smallest of proportions of cases in the population and k is the number of independent variables (Peduzzi et al., 1996). Therefore, the minimum sample size to be included is $N = 10k/p$ (Peduzzi et al., 1996). So with p = 9.7% (the smallest proportion of disability cases) and k = 12, 1,237 participants were required. Therefore, there was a low probability of overestimating the effects of factors influencing the participants' health statuses.

Measures

Independent Variables

Socioeconomic status and family support; as well as gender, age, education level, and type of medical insurance were investigated. For family support, those who lived with a partner or other family members were considered "living together." Those who lived alone were considered "living alone." The type of family support was divided into two groups, supportive and non-supportive families, depending on whether those who lived with the participants were supportive or not.

Dependent Variables

Disability.

Disability was measured by the Korean version of the Activities of Daily Livings (ADLs) scale developed by Won et al. (2002). This 12-item ADLs tool assesses subjects' ability to keep their basic daily activities such as taking on and off clothes, washing their face, taking a bath, and eating. The participants were categorized into "completely independent" when they were able to do those activities without any help, "partial help needed" when they partially got help from others, and "entire help needed" when they entirely got help from others. Participants were categorized as "completely independent" when their responses to all 12 items were completely independent. They were categorized as "partial help needed" and "completely independent" when at least one out of the 12 responses was "ADL disability." Cronbach's alpha for the Korean ADLs was 0.94 when it was developed and 0.98 for this study.

Depressive symptoms.

The Geriatric Depression Scale Short Form Korea version (GDSSF-K) developed by Kee (1996) was used to measure depressive symptoms. GDSSF-K consists of 15 questions including a sense of emotional discomfort, critical thinking, unhappiness feeling, and so forth. The GDSSF-K scale ranges from 0 to 15. The more depressed a subject is the higher their score. A score of 4 or lower is categorized as normal, scores 5-9 are categorized as having mild depression, and scores 10-15 are categorized as having severe depression. In this study, a participant was considered to have depressive symptoms when their score was 10 or higher. Cronbach's alpha for the GDSSF-K was 0.88 when it was developed and 0.85 for this study.

Perceived poor health.

Perceived poor health was determined by how the participant thought of their health status. It was measured using a 5-point Likert-scale ranging from 1 (*very poor*) to 5 (*very good*). For the logistic regression analysis, their responses were dichotomized into two groups: the "not poor" group, which included "very good," "good," and "average"; and the "poor" group, which included "very poor" and "poor," which is consistent with other studies (Benjamins, Hirschman, Hirschtick, & Whitman, 2012; Chandola & Jenkinson, 2000).

Covariate Variables

Health behaviors and the number of diseases.

Health behaviors included smoking, drinking alcohol, and regular exercise. Smoking status was assessed using two questions, the first asking if they had smoked more than five packs of cigarettes in the last 2 years and, if they had, whether or not they currently smoked. Drinking alcohol was assessed by asking the participants whether they drank more than once a month. Regular exercise was assessed according to the frequency and length of time the participant exercised during the week. It was considered regular when they exercised more than 30 minutes at least three days per week (Chae, Kim, & Lee, 2013; Kim, Ko, & Chung, 2010).

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Table 1. *General Characteristics of Participants*

Characteristics	Men	Women	Total
Age, *n*(%)			
65-74	349(57.8)	809(45.2)	1,158(48.4)
75-84	213(35.3)	789(44.1)	1,002(41.9)
85+	42(7.0)	190(10.6)	232(9.7)
M±SD	74.24±6.11	75.81±6.37	75.41±6.34
Education Level, *n*(%)			
< 6yr	204(33.8)	1,278(71.5)	1,482(62.0)
6-8yr	211(34.9)	369(20.6)	580(24.2)
≧ 9yr	189(31.3)	141(7.9)	330(13.8)
Type of health insurance, *n*(%)			
Health insurance	315(52.2)	1,033(57.8)	1,348(56.4)
Medicaid	289(47.8)	755(42.2)	1,044(43.6)
Family support, *n*(%)			
Living with supportive family	190(31.5)	721(40.3)	911(38.1)
Living with non-supportive family	111(18.4)	269(15.0)	380(15.9)
Living alone	303(50.2)	798(44.6)	1,101(46.0)
Smoking, *n*(%)			
Yes	167(27.6)	145(8.1)	312(13.0)
No	437(72.4)	1,643(91.9)	2,080(87.0)
Drinking alcohol, *n*(%)			
≧ Once per month	203(33.6)	165(9.2)	368(15.4)
< Once per month	401(66.4)	1,623(90.8)	2,024(84.6)
Exercise, *n*(%)			
Regular (3 times per week)	284(47.0)	519(29.0)	803(33.6)
Irregular (< 3 times per week)	320(53.0)	1,269(71.0)	1,589(66.4)
Number of diseases, *M*±SD	1.90±1.39	2.23±1.29	2.15±1.33
Total	604(100.0)	1,788(100.0)	2,392(100.0)

Table 2. *Gender-stratified Prevalence of ADL Disability, Depressive Symptoms, and Perceived Poor Health*

	ADL disability			Depressive symptoms			Perceived poor health		
	Men	Women	Total	Men	Women	Total	Men	Women	Total
Characteristics	%	%	%	%	%	%	%	%	%
Prevalence	9.6	9.7	9.7	34.3	38.5	37.4	45.7**	56.8	54.0
Age									
65-74	9.2	8.5	8.7	39.8	40.1	40.2	49.3*	56.0	54.0
75-84	9.9	9.8	9.8	25.8	36.4	34.1	41.8*	57.7	54.3
85+	11.9	14.2	13.8	31.0	38.9	37.5	35.7**	56.8	53.0
Education level									
≧ 9yr	8.3	9.7	9.5	29.4**	39.0	37.7	42.6**	58.5	56.3
6-8yr	8.1	9.2	8.8	34.6	37.7	36.6	44.5*	55.0	51.2
< 6yr	12.7	10.2	11.8	39.2	35.5	37.6	50.3	46.8	48.8
Type of health insurance									
Health insurance	10.8	9.8	10.0	27.0**	33.2	31.8	39.7**	54.2	50.8
Medicaid	8.3	9.5	9.2	42.2	45.7	44.7	52.2*	60.4	58.1
Family support									
Living with supportive family	11.2	9.4	9.9	25.1	28.4	27.5	38.9**	53.6	49.6
Living with non-supportive family	11.7	15.2	14.2	39.6**	56.1	51.3	51.4*	66.2	61.8
Living alone	5.8	7.9	7.5	45.8	43.0	43.6	53.2	56.9	56.1

Note. *p < .05, **p < .01 for differences between men and women.

Table 3. *Age-stratified Prevalence of ADL Disability, Depressive Symptoms, and Perceived Poor Health*

	ADL disability			Depressive symptoms			Perceived poor health		
	64-74	75-84	85+	64-74	75-84	85+	64-74	75-84	85+
Characteristics	%	%	%	%	%	%	%	%	%
Prevalence	5.3**	6.6	12.1	40.2*	34.1	37.5	54.0	54.3	53.0
Education level									
≧ 9yr	7.7	9.5	11.1	43.5*	27.6	27.8	48.8	51.4	33.3
6-8yr	5.6	6.2	0.0	39.0	33.0	29.6	50.1	52.6	55.6
< 6yr	4.2**	6.3	13.9	39.9	35.4	39.6	58.1	55.2	54.5
Type of health insurance									
Health insurance	7.0*	6.7	13.3	32.8	30.8	31.1	50.6	51.8	47.4
Medicaid	3.3**	6.4	10.3	48.7*	39.0	46.4	57.7	58.0	60.8
Family support									
Living with supportive family	7.5*	9.0	15.7	30.0	24.3	29.1	47.4	50.8	54.3
Living with non-supportive family	7.3	8.3	18.8	53.6	50.9	40.6	64.2	61.5	50.0
Living alone	1.9	2.9	2.7	46.5*	38.6	50.7	57.4	55.3	52.1

Note. *p < .05, **p < .01 for differences among age groups.

The number of diseases was determined by the number of self-reported doctor-diagnosed diseases including cancer, musculoskeletal disorders, endocrine metabolic diseases, respiratory system diseases, eye and ear problems, anemia, chronic kidney disease, skin diseases, intestinal disease, dementia, or psychiatric disorders.

Data Analysis

The data were analyzed using SPSS 23.0. The participants' socioeconomic factors, health behaviors, and family support were described using frequencies and percentages. The level of ADL disability, depressive symptoms, and perceived poor health by socioeconomic factors and family support were provided in percentages.

Multivariate logistic regressions (ADL disability, depressive symptoms, and subjective health as dependents variables) were run as follows: gender, family support, education level, type of medical insurance, health behaviors, and the number of diseases. Multivariate logistic regressions by gender were run to identify gender differences in the factors that had influenced their health status.

Results

Health Status

Data from 2,634 older Korean adults (604 men and 1,788 women) were included in this analysis (Table 1). We found more men than women to be Medicaid recipients. Nearly 32% of men and 10% of women indicated that they have a supportive family even though men were more likely to live alone than women. We also found that men were more likely than woman to be smokers and drinkers. However, men exercised more and had fewer diagnosed diseases compared to women.

Table 2 shows the differences between the health statuses of men and women for socioeconomic status and family support. There were no differences between men and women in ADLs disability or depressive symptoms. However, women were more likely to perceive their health as poor compared to men. The differences in perceived health between men and women were greater depending on their education level, type of medical insurance, and family support. In addition, for levels of depressive symptoms, there were age differences between men and women who graduated from a middle school or above, lived with non-supportive families, and were medical insurance subscribers. For those who did not complete any school and were Medicaid recipients, the older one was, the more serious his or her ability of ADLs. For those who graduated from a middle school or above, the older they were, the less depressive symptoms they had (Table 3).

Health Status by Socioeconomic Factors and Family Support

Table 4 shows the factors that influenced their health statuses. Participants who were 85 years and older and participants who lived with non-supportive families were more likely to be disabled in ADLs. Those aged 65-74 years were more likely to have depressive symptoms, compared to those aged 75-84 years. Those who lived with non-supportive families and lived alone were more likely to have depressive symptoms. Participants who received Medicaid were more likely to have depressive symptoms, compared to those who did not. Participants who lived with non-supportive families were more likely to perceive their health as poor. There was no relationship between education level and health status.

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Table 4. *Influencing Factors on Health Status*

Characteristics	ADL disability Adjusted *OR*(95% CI)	Depressive symptoms Adjusted *OR*(95% CI)	Perceived poor health Adjusted *OR*(95% CI)
Gender			
Male	1.00	1.00	1.00
Female	0.80(0.55-1.15)	1.06(0.84-1.35)	1.13(0.90-1.42)
Age			
65-74	1.00	1.00	1.00
75-84	1.10(0.81-1.49)	0.79 (0.65-0.95) *	0.98(0.82-1.18)
85+	1.63(1.04-2.56)*	1.03(0.75-1.41)	0.98(0.72-1.34)
Family support			
Living with supportive family	1.00	1.00	1.00
Living with non-supportive family	1.51(1.05-2.18)*	2.43(1.88-3.13)**	1.39(1.08-1.80)*
Living alone	0.82(0.58-1.16)	1.76 (1.43-2.16) **	1.11(0.91-1.36)
Education level			
≧ 9yr	1.00	1.00	1.00
6-8yr	0.71(0.47-1.09)	0.99(0.73-1.33)	1.11(0.83-1.49)
< 6yr	0.73(0.46-1.14)	0.98(0.74-1.29)	1.24(0.94-1.62)
Type of health insurance			
Health insurance	1.00	1.00	1.00
Medicaid	0.90(0.66-1.22)	1.32(1.10-1.60) **	1.18(0.98-1.43)

Note. Adjusted variable: health behavior such as smoking, drinking, exercising, and number of diseases; *p < .05, **p < .01.

Table 5. *Factors Related to Health Status by Gender*

Characteristics	ADL disability		Depressive symptoms		Perceived poor health	
	Men Adj. *OR*	Women Adj. *OR*	Men Adj. *OR*	Women Adj. *OR*	Men Adj. *OR*	Women Adj. *OR*
Age						
65-74	1.00	1.00	1.00	1.00	1.00	1.00
75-84	1.02(0.56-1.87)	1.13(0.79-1.61)	0.56(0.37-0.84)	0.86(0.70-1.07)	0.77(0.53-1.13)	1.07(0.86-1.32)
85+	1.14(0.40-3.26)	1.78(1.08-2.93)*	0.81(0.38-1.73)	1.08(0.76-1.53)	0.61(0.29-1.27)	1.10(0.78-1.56)
Family support						
Living with supportive family	1.00	1.00	1.00	1.00	1.00	1.00
Living with non-supportive family	0.95(0.45-2.03)	1.75(1.14-2.67)*	1.47(0.88-2.45)	2.86(2.12-3.85)**	1.25(0.77-2.05)	1.44(1.06-1.95)*
Living alone	0.59(0.26-1.30)	0.90(0.61-1.34)	1.91(1.19-3.04)**	1.71(1.35-2.16)**	1.49(0.95-2.34)	1.03(0.82-1.30)
Education level						
≧ 9yr	1.00	1.00	1.00	1.00	1.00	1.00
6-8yr	0.61(0.31-1.21)	0.84(0.44-1.61)	0.97(0.62-1.52)	1.09(0.72-1.67)	0.94(0.61-1.45)	1.41(0.94-2.13)
< 6yr	0.68(0.34-1.35)	0.78(0.44-1.39)	0.74(0.47-1.18)	1.13(0.77-1.65)	0.92(0.60-1.43)	1.55(1.67-2.24)*
Type of health insurance						
Health insurance	1.00	1.00	1.00	1.00	1.00	1.00
Medicaid	0.83(0.44-1.55)	0.93(0.66-1.32)	1.49(0.99-2.25)	1.29(1.04-1.61)**	1.27(0.86-1.88)	1.15(0.92-1.43)

Note. Adj. = Adjusted; Adjusted variable: health behavior such as smoking, drinking, exercising, and number of diseases; *OR*, 95% CI; *p < .05, **p < .01.

By comparing the factors that influenced health status, we found that education level and type of medical insurance did not have an influence on their ADLs disability, depressive symptoms, or perceived poor health for men. When age, health behaviors, and the number of diseases were adjusted, those who lived alone were more likely to have depressive symptoms, compared to those who lived with supportive families (Table 5).

For women, we found that educational levels did not influence their ADLs disability and depressive symptoms. However, participants who had less than 6 years of education were more likely to perceive their health as poor compared to those with more than 9 years of education.

Discussion

These findings demonstrate that older Korean women have a lower socioeconomic status and a higher perception of poor health than men. Women who had more than 9 years of education, had health insurance, but lived with non-supportive families, experienced more depressive symptoms than men. These results are similar to what is in the literature suggesting that women who are in the same economic status as their male counterparts have poorer health statuses (Jeon, Jang, & Rhee, 2009; Oh & Ko, 2015; Vlachantoni, 2012). This is also similar to the results of another study that reported that inequality based on income levels is deeper in mental health than in physical health (Kim, 2011). Due to a higher life expectancy among women, these women may have experienced their partner's death or had changes in family members who lived with them at older ages (Deeg, Portrait, & Lindeboom, 2002), which may explain the differences in health statuses between men and women (Davidson, Digiacomo, & McGrath, 2011).

It is worth noting that there were significant differences in the experience of depressive symptoms among men and women who had more than 9 years of education, had a higher socioeconomic status, and had health insurance. The higher the level of education, the better job, higher income, better living arrangement, and better work environment they had. However, Jeon (2008) found no connection between levels of education and socioeconomic status for women. Further research is needed to examine the influence of education on the health statuses of older Korean women because their educational level may not reflect their socioeconomic status.

Differences in health status based on socioeconomic status did not vary with age. This can be taken as a convergence hypothesis that explains inequality in health among older Korean adults (House et al., 1994; Jang, 2013). That is, the difference in health status based on the socioeconomic status becomes bigger before senility, and then becomes smaller in senility (House et al. 1994; Jang, 2013). Korean studies have suggested that inequality in health is based on income levels when comparing the health statuses of early older adults to older adults (Kim, 2012; Oh & Ko, 2015). However, a study from another country states that the older adults become, the more likely they are to have chronic diseases and to perceive their health as poor (Huisman et al., 2004). This may be due to different political and cultural factors which influence one's health status in different countries.

The factors that influenced health statuses were age and family support along with their ADLs disability; age, family support, and type of medical insurance in the depressive symptoms; and family support in perceived poor health. However, when we compared the men's and the women's health statuses, there was a difference in the level of influence on socioeconomic status. For men, there was no difference in health status based on education level, but women who did not complete any school were more likely to perceive their health as poor, which is supported by previous studies (Khang et al., 2004; Oh & Ko, 2015). They reported that the magnitude of educational inequality in health status was not constant across causes and in some cases differed by gender (Khang et al., 2004). About 70% of the women did not complete any school and only a few of them graduated from a middle school or above, which again may explain the differences in health statuses. Therefore, providing health care programs for older women who have a lower education level may be an effective way to improve their health inequality.

For health status based on the type of medical insurance, those who had Medicaid were more likely to have depressive symptoms than those who carried health insurance for both men and women. In Korea, those who have a lower income receive medical services and use health care facilities at no cost or at a discounted price. Those who have a lower income use health care facilities as often as those who have a higher income or even more frequently, but the quality of the health care services are higher in those who have a higher income (Kim, 2011). Therefore, it is necessary to improve the quality of health care services for those who have a lower income in order to reduce inequalities in health.

It is worth noting that family support is more important for health status than socioeconomic status for this group studied. Thus, there needs to be an in-depth assessment of family support to select target participants for home visiting care services. In this study, men who lived alone were more likely to have depressive symptoms than those who lived with supportive families. Particularly, men who had not completed any school or had received Medicaid – many of them lived alone. This could be a useful point for decreasing suicide rates in older Korean men (Kim & Kim, 2011). More social support is needed other than family support for this vulnerable population. For women who lived with non-supportive families, they

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were more likely to have depressive symptoms compared to those who lived alone or with a supportive family. Therefore, home visiting care providers should know that living with families does not always guarantee they are getting support.

Limitations

Limitations of this study include the fact that participants already received home visiting care services from the public health center as the center is available for all older adults. However, those who have a lower income, are more likely to use these services. Thus, the participants may not represent the whole population of older Korean adults. Second, we defined participants' economic status as having or not having health insurance. Therefore, it is necessary to re-examine the health statuses of older Korean adults based on their socioeconomic status with accurate family income information. Finally, it has been found that family support has an influence on health status. However, there needs to be further investigation for measuring and analyzing family support, more specifically, in order to find a way to strengthen it.

Conclusions

Based on the findings of this study, we suggest that home visiting care services target recipients not only on their socioeconomic status but also their family support in order to reduce inequalities in health. We also suggest to improve inequality in mental health status, more social support substituted for family support is needed for men who live alone. Finally, a gender-specific approach should be provided to reduce health inequality in this vulnerable population.

Declaration of Conflicting Interests

The authors have declared no conflict of interest.

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