

Prevalence and Predictors of Geriatric Depression in Community-Dwelling Elderly

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Purpose This study aimed to examine the relationship between depressive mood and physical and socio-environmental variables of community-dwelling elderly.

Methods This study was designed as a cross-sectional descriptive survey. The setting was two elderly welfare centers and two public health centers in Korea. The subjects were recruited by public announcement and participated after giving their written informed consent. A total of 295 participants were included in the final analysis. The Korean version of the short form of Geriatric Depression Scale (SGDS-K), Tokyo Metropolitan Institute of Gerontology Index of Competence (TMIG-IC) of activities of daily living (ADL) and a socio-demographic questionnaire were administered to participants. Hand-grip strength was measured with a hand dynamometer.

Results The prevalence of depression among the subjects was 63%. Of the elderly, 21% had severe depressive symptoms. The mean depression score was 6.21 ($SD=3.83$) and it was higher in women than in men. In the regression analysis, perceived health status alone had an accountability of 17.3% to depression. When TMIG-IC was added, this increased to 22.6%. Additionally, when hand-grip strength and social activities were input, it increased to 25.2%. Therefore, perceived health status was a significant and powerful factor explaining depression among the Korean elderly.

Conclusion In this research, perceived health status was the most powerful predictor of elderly depression. TMIG-IC, hand-grip strength and social activities also predicted Korean elderly depression. These factors should be considered when the program is developed for elderly people with depression. [*Asian Nursing Research* 2009;3(3):121–129]

Key Words elderly, hand strength, health status

INTRODUCTION

Depression is a medical illness characterized by persistent sadness, discouragement, and loss of self-worth. It may be accompanied by reduced energy and concentration, sleep problems (insomnia), decreased

appetite, weight loss, and bodily aches (Medical Encyclopedia, retrieved October 31, 2008). Depression is a widespread problem in older people. The prevalence of depression has been reported to be 15.2–44% in Korea (Lee, Choi, Jung, & Kwak, 2000; Lee & Shinkai, 2005), 19.8–33.5% in Japan (Lee &



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Shinkai, Wada et al., 2004), and 20.1% in urban elders in Taiwan (Chiu, Chen, Huang, & Mau, 2005). In the United States, 13–27% of adults aged 65 and above living in the community suffer from sub-clinical depression (National Institute of Mental Health, 2004).

What factors are related to the causes of depression? Some researchers have focused on socioeconomic variables such as advanced age, low education, poor economic status, manual occupation and current living situation as the causes of depression, and demonstrated that these variables had a relationship with depression (Ham, Kim, & Cho, 1999; Kim, Shin, Yoon, & Stewart, 2002; Lee et al., 2000; Lee & Hong, 2002). In particular low socioeconomic status was significantly associated with depression after adjustment for age, illness, sex, and self-rated health (Murata, Kondo, Hirai, Ichida, & Ojima, 2008).

In Korea, the elderly population is predicted to be 14% of the total population in 2018 (Korea National Statistical Office, 2008). This trend has recently brought an increase in the number of frail elders with chronic diseases or mental/physical disorders. Kim (2001) reported that co-morbidity of diseases was 2.1, that is, elderly people had two or more chronic diseases. Co-morbidity may be correlated with depression among the elderly, but it has not been reported yet in Korea. Perceived health status has been increasingly recognized as an important indicator of multi-dimensional health. In particular, it was associated with illness-related variables such as chronic conditions or disabilities (Cott, Gignac, & Badley, 1999). Two studies (Demura & Sato, 2003; Mulsant, Ganguli, & Seaberg, 1997) revealed that depression had a negative association

with perceived health status in the community-dwelling elderly. Also, several clinical trials reported a positive correlation of depression with functional decline, activities of daily living (ADL) impairment, and mortality (Katon, Sullivan, Russo, Dobie, & Sakai, 1993; Oxman & Hull, 2001; Onishi et al., 2004; Unutzer, Patrick, Marnon, Simson, & Katon, 2002) and with steep strength decline (Rantanen et al., 2000). In Korea, Park and Park (2008) reported that muscle weakness in the extremities was a factor that increases depression in community-dwelling elderly.

Most of the previous studies on geriatric depression have focused on its high prevalence rate. They have not attempted to reduce the occurrence of depression among the elderly. There are few predictive studies on depression among the elderly in Korea. The way in which depression among the elderly is related with perceived health status, competence of ADL and grip strength has rarely been studied. Finally, these factors were not examined to explore whether they could predict elderly depression in Korea. The identification of factors to predict the depression level among the elderly population can pave the way to develop an effective nursing intervention for decreasing geriatric depression. The nursing intervention should be focused on changeable factors or behavioral characteristics.

Based on the literature, we made a research model for the elderly with depression as shown in Figure 1.

Demographic factors such as age and sex, and co-morbidity cannot be modified, whereas perceived health status, competence of ADL, hand-grip strength and social activity participation can contribute to diminishing depression through nursing interventions. After this research has finished, we are going to

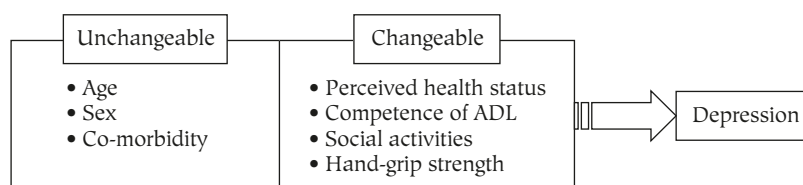


Figure 1. Research model for the elderly with depression.

develop a program for modifying depression using these changeable variables in this model.

In this study, one purpose was to identify the prevalence of depression in the community-dwelling elderly in Korea. Another was to explain what factors had an impact on depression, with particular focus on changeable variables such as perceived health status, competence of ADL, hand-grip strength, and social activities. The findings from this study may provide some valuable information about depression in the elderly in Korea and contribute to identifying factors that can be modified by nursing interventions.

METHODS

Research design

This study was conducted through a cross-sectional descriptive survey to explore the prevalence of depression and its relevant factors.

Sample and procedures

Two hundred and ninety five subjects were recruited by public announcement from four elderly welfare centers or public health centers in urban and suburban areas. Because poor cognitive or physical condition of the elderly may be a confounding factor of geriatric depression in this study, the sample was selected by the following inclusion criteria: (a) age ≥ 65 years; (b) able to read, speak, and write Korean; (c) no cognitive impairment revealed by Mini Mental Status Examination (MMSE) with completion of the three sub-tests (immediate memory, recall, and drawing two pentagons one over the other); and (d) no physical impairment which means Barthel Index score=100. Data were gathered from June 23 to July 2, 2004. Informed consent (written in Korean) was obtained from each participant under permission from the four institutions. After informed consent was obtained by two researchers, the participants completed the questionnaires. The researchers stayed in the room to answer questions or concerns from the participants. After that, grip strength of the dominant hand was measured by a trained research assistant.

MEASURES

Socio-demographic characteristics

The first set of questions asked about socio-demographic characteristics. The questionnaire consisted of six items regarding the participants' age, sex, marital status, education, cohabitants, and type of residence.

Co-morbidity

Co-morbidity was ascertained by asking if participants had been diagnosed by physicians and were currently receiving treatment for any of the following: cancer, heart disease, stroke, hypertension, diabetes, osteoporosis, arthritis, trauma, respiratory disease, gastrointestinal disease, liver disease, mental illness, visual/hearing impairment, dysphagia, incontinence, and others. Co-morbidity was the number of diseases that were diagnosed by physicians.

Perceived health status

The older adults responded to the following question about their health status: "In general terms, how would you describe your health status: very good, good, fair, poor, or very poor?" No health-related questions that could influence the response were made before asking the respondents to rate their health status (Damian, Pastor-Barriuso, & Valderrama-Gama, 2008).

Competence of activities of daily living (ADL)

The Korean version translated from the Tokyo Metropolitan Institute of Gerontology Index of competence (TMIG-IC) of ADL (Koyano, Shibata, & Nakazato, 1991) was used and printed after the author's permission was obtained (Choe, Chae, Kim, & Jeon, 2006). Higher-level ADLs were measured using the TMIG-IC consisting of 13 items. The TMIG-IC was developed to measure higher-level ADLs such as self-maintenance, intellectual activities, and social roles among the elderly. The maximum possible score was 13 and a higher score indicated a higher level of competence (Koyano et al.). The TMIG IC was tested for reliability (Cronbach's $\alpha = .92$) in older Korean adults (Lee & Shinkai, 2005).

Social activities

Social activities were evaluated using a question of "Do you take part in social activities?" When the answer was "yes", subjects were further asked about the type of activity, frequency of activity per week, and time spent on each activity that they were involved in.

Hand-grip strength

Hand-grip strength, a measure of strength of the hand and the forearm muscles, is a useful index of overall muscle strength (Choe et al., 2008). Handgrip strength was measured with a hand dynamometer (TKK 5101, Takei Corp., Japan). While each participant was standing, he/she was instructed to exert his/her maximum grip. The higher value of two trials was used in this study. Grip strength was expressed in kilograms.

Depression

The Korean version of the short form of the Geriatric Depression Scale (SGDS-K) (Choe et al., 2006), a shortened form of the Geriatric Depression Scale (Sheik & Yesavage, 1986) was administered as a basic screening measure for depression in older adults. This is a 15-item self-report binary response format (yes/no) with a range of scores from 0 to 15. Severity was assessed by GDS scores. Scores greater than 5 points suggest depression and the need for a follow-up interview, and scores greater than 10 almost always indicate depression. According to GDS score, 5–7 indicates mild depression, 8–12 moderate depression, and 13 or higher severe depression. Reliability demonstrated high internal consistency as Cronbach's $\alpha = .83$.

Statistical analyses

SPSS version 15.0 was used for data analysis. Descriptive statistics were performed initially to describe the distribution of sample characteristics. Independent sample *t* tests were used to compare depression scores between men and women. Before regression, correlation was analyzed. The correlation of depression with categorical variables was analyzed by Spearman's rank correlation and that

with continuing variables was analyzed by the Pearson correlation method. Univariate analysis and stepwise multiple regression analysis were performed to identify the predictors of geriatric depressive symptoms. Due to the characteristics of multiple regression analyses, social activity was operationalized as a continuous variable by coding 'not participate' as '0' and 'participate' as '1'. The critical value for statistical significance was set to an alpha level $< .05$.

RESULTS

General characteristics

The number of subjects was 295. The mean age of the subjects was 72.7 years ($SD = 4.8$, range = 65–84 years). Sixty five percent ($n = 192$) of the subjects were women. Sixty percent ($n = 178$) of the subjects were married, and the rest were bereaved, separated, or divorced. In total, 43.4% of subjects were residing with a spouse (in men 61.2%, in women 33.9%). In terms of education level, only 23.7% were high school or college graduates. The mean score of perceived health status was 2.5 ($SD = 0.9$), and the score was higher in men than in women. The mean co-morbidity was 2.9 and it was higher in women (3.1) than in men (2.7) (Table 1).

Prevalence of depression and its scores

The prevalence of depression among the subjects was 63%; and the mean depression score was 6.21 ($SD = 3.83$). Women had a higher depression score than men. Forty-two percent of the subjects had moderate depression and 21% had severe depression (Table 2).

Predictors of depression by regression

To identify predictors, first, we conducted an analysis of correlation with all socio-demographic variables and physical variables. The depression score showed a significant low correlation with social activities, type of residence, sex, and co-morbidity. The depression score had a significant low correlation with education ($r = -.265$, $p = .000$), TMIG-IC ($r = -.293$, $p = .000$), and hand-grip strength

Table 1

<i>Socio-demographic Characteristics</i>				<i>N = 295</i>
Variables	Category	Men <i>n</i> (%)	Women <i>n</i> (%)	Total <i>n</i> (%)
Spouse	Have	87 (84.5)	91 (47.4)	178 (60.3)
Education	<High school	58 (56.3)	167 (87.0)	226 (76.3)
	≥High school	45 (43.7)	25 (13.0)	70 (23.7)
Living alone or with others	Alone	7 (6.8)	50 (26.0)	57 (19.3)
	Spouse only	63 (61.2)	65 (33.9)	128 (43.4)
	Family	33 (32.0)	77 (40.1)	110 (37.3)
Type of residence	Individual house	90 (87.4)	174 (90.6)	264 (89.5)
	Apartments	13 (12.6)	18 (9.4)	31 (10.5)
Perceived health status	Mean (<i>SD</i>)	2.7 (0.9)	2.4 (0.9)	2.5 (0.9)
	Poor or fair	42 (40.8)	98 (51.0)	140 (47.5)
	Good or excellent	61 (59.2)	94 (49.0)	155 (52.5)
		Mean (<i>SD</i>)	Mean (<i>SD</i>)	Mean (<i>SD</i>)
Age		72.5 (5.1)	72.6 (4.6)	72.7 (4.8)
Co-morbidity		2.7 (2.3)	3.1 (2.2)	2.9 (2.2)
TMIG-IC		10.5 (2.3)	9.5 (2.4)	9.8 (2.4)
Hand-grip strength (Kg)		31.8 (8.3)	19.5 (5.4)	23.8 (8.8)

Table 2

<i>Depression Scores in Korean Elderly</i>				
Gender	Mean (<i>SD</i>)	Moderately depressed <i>n</i> (%)	Severely depressed <i>n</i> (%)	Total <i>n</i> (%)
Men	5.69 (3.70)	42 (40.8)	17 (16.5)	59 (47.3)
Women	6.49 (3.87)	82 (42.7)	45 (23.4)	127 (66.1)
Total	6.21 (3.83)	124 (42.0)	62 (21.0)	166 (63.0)

($r = -.262$, $p = .000$). Only the perceived health status score had a significant moderate correlation with the depression score ($r = -.416$, $p < .001$). However, their age, the presence of a helper for daily activities, and living with others had no significant correlation with the depression score. Education, social activity, perceived health status, and TMIG-IC had a significant negative correlation with the depression score.

Second, the correlated variables were entered in the regression model. Perceived health status alone explained 17.3% of the total variance (Model 1).

Adding TMIG-IC significantly improved the model (R^2 change from model 1 = 0.053, $p < .001$) (Model 2). When hand grip strength was added, they explained 23.7% of the total variance (R^2 change from model 2 = 0.011, $p < .001$) (Model 3). When the regression model was rerun with perceived health status, TMIG-IC, hand grip strength, and social activities as independent variables, the accountability was 25.2% of the total variance (R^2 change from model 3 = 0.015, $p < .001$) (Model 4). Therefore, perceived health status was a strong predictor of elderly depression (Table 3).

Table 3*Predictors of Elderly Depression*

	Model	R	R ²	Adjusted R ²	F	Beta	t test
Model 1	PHS	.416	.173	.170	61.171***	.416	7.821***
Model 2	PHS	.475	.226	.220	42.572***	.379	7.266***
	TMIG-IC					-.233	-4.473***
Model 3	PHS	.487	.237	.229	30.182***	.362	6.888***
	TMIG-IC					-.192	-3.472**
	GP					-.117	-2.100*
Model 4	PHS	.502	.252	.241	24.370***	.348	6.634***
	TMIG-IC					-.154	-2.676**
	GP					-.133	-2.375*
	SA					-.126	-2.350*

PHS=perceived health status; TMIG-IC=Tokyo Metropolitan Institute for Geriatrics Index of Competence of ADL; GP=hand-grip strength; SA=social activities. * $p < .5$, ** $p < .01$, *** $p < .001$.

DISCUSSION

Depression in the elderly is a widespread problem that is often not diagnosed and is frequently undertreated. Many older people will not admit the signs and symptoms of depression for fear that they would be seen weak or crazy. Some older people may be aware of their depression but believe that nothing can be done about it (Magnil, Gunnarsson, Björkstедt, & Björkelund, 2008).

Prevalence of depression in the elderly

In this study, the prevalence of depression was 63%, and 21% of the older adults had severe depression. This rate was higher than other studies which reported it as 15–44% (Ham et al., 1999; Kim et al., 2002; Lee et al., 2000; Lee & Shinkai, 2005), 33.5% in Japan (Wada et al., 2004), 21.7–29.9% in Taiwan (Chong et al., 2001) and 30.8% in China (Gao et al., 2009). In particular, the prevalence of depression among Korean elderly women was higher than that among Korean men (women 66.1%, men 47.3%; severe cases of depression: women 23.4%, men 16.5%). This finding was similar to the result of Gautam, Saito, and Kai (2007). Korean society is based on the Confucian idea under which women's roles and positions are limited especially in this

generation. Because of socially fixed limitations in roles that Korean women are expected to perform, Korean elderly women may have a high rate of depression. A study by Gautam et al. (2007) explained that women, who are significantly more depressed than men, may not give high priority to outdoor activities. Further research is needed to explore the reason for the high prevalence of depression in the Korean elderly and strategies for decreasing depression in the elderly.

Predictors of depression

In this study, perceived health status and hand-grip strength were negatively correlated with the SGDS-K score and the number of diseases was positively correlated with SGDS-K. This was consistent with other findings (Sin, LoGerfo, Belza, & Cunningham, 2004; Noel et al., 2004). In this study, the predictors of depression in the Korean elderly were perceived health status, TMIG-IC, hand-grip strength, and social activities. Among them, perceived health status was the most powerful predictor of elderly depression. Similarly, Demura and Sato (2003) reported that self evaluation of health status showed a moderately significant relationship with depression ($r = .599$, $p < .001$) in a group of elderly female Japanese. When we suggest a realistic strategy to

diminish geriatric depression and to relieve it, we should be focused on increasing perceived health status by encouraging social and physical activities. Activity-related indices such as the frequency of going outdoors were found useful indicators that predict functional and psychological changes among community-dwelling elderly in Japan (Kono, Kai, Sakato, & Rubenstein, 2004) and Nepal (Gautam et al., 2007).

Strategies for geriatric depression

Untreated depression is associated with serious negative consequences for the elderly. For example, depression is a major cause of elderly suicide (Montano, 1999). How can we relieve geriatric depression? In this study, perceived health status was a major predictor of depression, and TMIG-IC and social activities had a significant negative correlation with the score of SGDS-K. Similarly, Onishi et al. (2004) reported that the overall GDS score was correlated with Basic Activities of Daily Living (BADL) and Instrumental Activities of Daily Living (IADL) in Japan. Greater physical activities had a preventive effect for prevalent depression (McAuley et al., 2000; Strawbridge, Deleger, Roberts, & Kaplan, 2002).

We need to conceive strategies to relieve depression and to reduce the prevalence of depression in the Korean elderly. Furthermore, physical conditions including health status and social activity may be considered important factors when planning an intervention for the depressive elderly. If they have stressful life events such as the loss of loved ones and chronic illness interrupting daily activities, such events may trigger a depressive mood and result in suicide.

On the other hand, Pfaff et al. (2009) reported that the geriatric depression level was significantly different depending on education level. This factor may not be changed by nursing intervention but should be considered to be an important factor in depression for the elderly when developing educational materials. Economic support is also important as a strategy to diminish geriatric depression. Schultz et al. (2006) insisted that a higher household income might help reduce symptoms of depression by reducing financial stress and strengthening social support.

Limitations

There were some limitations in this study. First, a cross-sectional study design was utilized to examine the relationship between depression and physical and socio-environmental variables. The cross-sectional nature of the study makes it impossible to determine causal relationships. Second, as the sample size was not large enough to identify the prevalence of depression in the Korean elderly and the study focused on the community-dwelling elderly, it may not be generalizable to other areas. Third, we relied upon self-reports of co-morbidity and did not assess the severity of the diseases. However, subject-centered measures are being recognized as increasingly important variables.

CONCLUSION

Sixty-three percent of the community-dwelling elderly had depression. This suggests that the Korean elderly have a higher prevalence of depression than those in other Asian countries. Perceived health status was the most powerful predictor to explain geriatric depression. Next, TMIG-IC, hand-grip strength and social activities had predictability for geriatric depression. This suggests that changeable factors such as perceived health status, competence of ADL, and social activities impacting on depression may be considered as variables in developing interventions for improving mood states in the elderly. Also, this study provides useful baseline information for future intervention studies for community-dwelling elderly. Various social activities need to be disseminated to all communities to improve their physical and psychological health.

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