

## Depression and suicidal ideation in community-dwelling older adults in Korea<sup>†</sup>

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### Abstract

This study aimed to investigate the prevalence of depression and suicidal ideation in community-dwelling older adults in Korea, as well as identify factors associated with their occurrence, including cognitive impairment. A cross-sectional study of 484 residents was conducted at a senior centre utilising the PHQ-9K and K-MMSE. Demographic data were also collected for analysis. Of the respondents, 38.1% had symptoms of mild to severe depression. Further, 16.7% reported having suicidal ideation, with 5% of respondents having thoughts of suicide every day. The majority of participants had 'normal' scores on the K-MMSE (88.0%), though significant differences were observed in PHQ-9K scores between cognitive-acceptable and cognitive-impaired groups. Depressive symptoms and suicidal ideation were very prevalent in community-dwelling older adults in Korea. This study indicates the need for the development of community-based mental health programs tailored to older adults, and demonstrates the viability of promoting early detection of depressive symptoms through senior centres.

*Keywords:* Community, depression, Koreans, older adults, suicidal ideation.

### 1. Introduction

South Korea is one of the fastest-aging countries in the world. In fact, older adults are expected to comprise approximately 24.3% of the total population in 2030, from just 5.1% in 1990 (Kim and Traphagan, 2009). This rapid growth has resulted in a host of new challenges to Korean society and its health care system. The increase in suicides among its older adults has been especially disconcerting. In 2011, a total of 5,468 suicidal deaths were recorded for this population alone, with suicide rates among individuals aged 60-69, 70-79, and 80 and older estimated at 50.1/100,000, 84.4/100,000, and 116.9/100,000, respectively (Korean National Statistical Office, 2011). This rate ranks the highest among Organisation for Economic Cooperation and Development (OECD) member countries.

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Previous research on suicide among older adults has linked it to physical illness, socioeconomic-environmental status, and depression (Helliwell and Putnam, 2004; Shin *et al.*, 2013). Depression has been recognised as the most prevalent mental health problem afflicting older adults (Minardi and Blanchard, 2004), and is thus far the strongest predictive factor of suicide (Jang and Kim, 2005). The rates of depression in Korean older adults have been known to range widely, from 27.8% to 61.6%, depending on the region and measurements used (Park *et al.*, 2012; Kim and Park, 2012). These rates are considerably higher than those in the United States (10-24%) and Japan (10.4-29.1%) (Cole and Dendukuri, 2003; Kaneko *et al.*, 2007). Although depression detected through screening tests administered by health care providers is not necessarily clinical or requiring immediate treatment, individuals who have depressive symptoms for 2 weeks or longer are at higher risks of developing depressive disorders and suicidal ideation (National Institute of Mental Health, 2013). A higher prevalence of depression in older adults has been associated with age, gender (female), a family history of depression, physical illness/disability, stressful or traumatic life events, change in living patterns, social and interpersonal support, financial and educational status, urbanicity, loneliness, and personality (Artinian *et al.*, 2006; Minardi and Blanchard, 2004). Depression and cognitive function are seen as interrelated factors, although this view is open to dispute (Clement *et al.*, 2009).

Oddly, depression in old age tends to be overlooked because it frequently coexists with other age-related physical disorders. Moreover, older Korean individuals often highly value modesty and refrain from expressing their emotions because of their adherence to Confucian beliefs and traditions (Jang *et al.*, 2005). The importance of early detection and timely intervention of depression does not need further emphasizing. Outreach efforts geared toward depressed older adults reluctant to seek help from others are believed to be strategically effective in reducing suicide risks among these individuals (Oyama *et al.*, 2008). Society plays a crucial role in this regard. Its enthusiasm in reaching depressed older adults with the help and support they need is fundamental, as these individuals do not tend to seek help voluntarily. There are an anticipated 62 thousand government-established welfare facilities for senior citizens throughout South Korea to date, and this number is steadily rising (Korea Ministry of Health and Welfare, 2011). Due to their high accessibility to community-dwelling older adults, these facilities have increasingly been receiving attention with regard to their suitability as health screening and promotion venues (Kim and Song, 2006). However, the activities conducted and services provided at these centres remain primarily recreational and social. Therefore, the purpose of this study was to investigate the prevalence of depression and suicidal ideation in community-dwelling older adults who regularly visited a senior welfare centre in Korea, as well as identify associated factors, including cognitive impairment.

## 2. Methods

### 2.1. Subjects and data collection

Research subjects comprised community-dwelling older adults aged 60 and over who visited a senior welfare centre in Daegu, South Korea. The authors had obtained the cooperation of the centre's director beforehand to conduct their research, placing advertisement placards and posters of the study there. Subjects were recruited from the 23rd to 27th of July 2012, in the main lobby of the centre. One-on-one structured interviews, each lasting

approximately 15-20 minutes, were conducted in a separate room by five senior nursing students who had completed a one-day training course for administering the Patient Health Questionnaire-9 Korean (PHQ-9K) and the Korean version of the Mini-Mental State Examination (K-MMSE). Written informed consent was obtained from all research subjects, who participated in the study voluntarily. They were assured of their confidentiality and anonymity, and that there would be no potential harm in participating. In fact, their understanding of depression was enhanced in the process, along with their awareness of the need for seeking professional help. Out of the 486 participants who completed the interviews, 484 on whom complete data had been obtained were included in the analysis. Data were collected in accordance with a procedure evaluated and approved by the Institutional Review Board of the Kyungpook National Hospital (IRB 2012-05-001-001).

## 2.2. Measures

Demographic data including age, gender, marital and residential status, religion, years of education, fixed income, and average income per month were collected for all participants.

### 2.2.1. Depression

Depression was assessed with the Patient Health Questionnaire-9 Korean (PHQ-9K) (Donnelly and Kim, 2008). The PHQ-9 was first developed by Kroenke *et al.* (2001), and has since been used widely to screen for depressive symptoms. This scale is relatively easy to administer as well; prior research has demonstrated its reliability in primary care settings when administered by non-psychiatric interviewers (Ell *et al.*, 2006). Because Korean older adults tend to complain about somatic symptoms rather than cognitive and emotional ones (Lee and Farran, 2004), we determined that the PHQ-9K would be well suited to our study. The PHQ-9K is a brief nine-item self-reporting instrument with four-point Likert-type scales denoting a range of possible answers (from 'not at all' to 'nearly every day'). A total score of less than 4 may not indicate a need for depression treatment, while scores between 5 and 14 may call for treatment, based on the duration of symptoms and functional impairment. A score of 15 or over necessitates treatment. Suicidal ideation was assessed with a single item on the PHQ-9K, i.e., 'thoughts that you would be better off dead or of hurting yourself in some way' within 2 weeks. The Cronbach's  $\alpha$  reliability coefficient of PHQ-9K was measured at 0.813 in this study.

### 2.2.2. Cognitive function

Cognitive function was evaluated by using the Korean version of the Mini-Mental State Examination (K-MMSE), a quick screening instrument for mild cognitive dysfunction. This frequently used instrument in Korea is based on the original by Folstein *et al.* (1975), which was later translated into Korean and validated by Kang *et al.* (1997). It consists of 30 questions on temporal orientation, spatial orientation, memory registration, attention and calculation, recall, language skills, and visuospatial construction ability. Each item is scored 0 or 1, depending on whether it has been fulfilled. A total score of less than 24 implies cognitive impairment requiring further inquiry.

### 2.2.3. Data Analysis

Data were analysed with the Statistical Package for the Social Sciences or SPSS 19.0. All study variables, including demographic characteristics, depression, and cognitive function, were analysed along with descriptive statistics. In order to examine the factors that were associated with depression and suicidal ideation, the Mann-Whitney test and chi-square test were conducted. In addition, logistic regression models were fitted to examine the effects of demographic characteristics, depression, and cognitive impairment on suicidal ideation. We set the level of statistical significance as a two-sided  $p$  value  $< 0.05$ .

## 3. Results

### 3.1. Incidence of depression, suicidal ideation, and cognitive impairment

Depression scores averaged 4.86 (SD = 5.23) in our sample, 38.1% of whom presented with mild to severe depression. Eighty-one participants (16.7%) reported having suicidal ideation, with 5% of respondents having thoughts of suicide nearly every day. The majority of older adults we assessed in our study (88.0%) had normal cognitive function, and only 6 individuals (1.2%) showed severe impairment (Table 3.1).

**Table 3.1** Incidence of depression, suicidal ideation, and cognitive impairment ( $N = 484$ )

Characteristics		$n$ (%)	Mean (SD) <sup>†</sup>
Depression	Minimal, 0-4	300 (61.9)	4.86 (5.23)
	Mild, 5-9	100 (20.7)	
	Moderate, 10-14	58 (12.0)	
	Moderate severe, 15-19	16 (3.3)	
	Severe, 20-27	10 (2.1)	
	Not at all	403 (83.3)	
Suicidal ideation <sup>††</sup>	Several days	42 (8.7)	
	More than half the days	15 (3.1)	
	Nearly every day	24 (4.9)	
	Acceptable, $\geq 24$	426 (88.0)	
Cognitive function	Mild impairment, 20-23	52 (10.8)	26.43 (2.46)
	Severe impairment, $\leq 19$	6 (1.2)	

<sup>†</sup> SD = Standard deviation

<sup>††</sup> Single item on thoughts of being 'better off dead or of hurting yourself in some way' within 2 weeks

### 3.2. Depression and suicidal ideation according to demographic characteristics and cognitive impairment

The mean age of participants was 72.38 years (SD = 5.23); 61.2% were in their 70s. Women comprised the majority (60.7%), and most had a spouse (63.2%). Further, 22.3% lived alone and 49.8% did not have monthly income. Subsequent data analysis did not reveal any significant associations between depression and age, gender, marital status, residential status, religion, years of education, or average monthly income. However, individuals with cognitive impairment were more likely to have severe depressive symptoms compared with those who had normal cognitive function. Suicidal ideation was not significantly correlated with age, marital status, residential status, religion, years of education, average monthly income, or cognitive function, but was related to gender (Table 3.2).

**Table 3.2** Depression and suicidal ideation according to demographic characteristics and cognitive impairment ( $N = 484$ )

Characteristics	n (%)	Depression <sup>†</sup> ( $n = 484$ )		Suicidal ideation <sup>††</sup> ( $n = 81$ )				
		Mean (SD)	$U/\chi^2$	$p$	$\chi^2$	$p$		
Age (yr.)	60~69	144 (29.8)	4.67 (5.030)	0.867	.648	26 (32.1)	3.080	.214
	70~79	296 (61.2)	4.83 (5.221)			44 (54.3)		
	80~	44 (9.1)	5.73 (5.888)			11 (13.6)		
Gender	Male	190 (39.3)	5.32 (5.509)	25383.5	.088	40 (49.4)	4.183	.046*
	Female	294 (60.7)	4.57 (5.022)			41 (50.6)		
Spouse	None	178 (36.8)	5.10 (5.580)	26599.5	.667	29 (35.8)	.040	.900
	Have	306 (63.2)	4.73 (5.012)			52 (64.2)		
Residential status	Living alone	108 (22.3)	5.89 (6.011)	3.222	.200	19 (23.5)	.086	.958
	Living only with spouse	251 (51.9)	4.61 (4.976)			41 (50.6)		
	Living with offspring	125 (25.8)	4.49 (4.907)			21 (25.9)		
Religion	No	142 (29.2)	5.07 (5.473)	23866.0	.776	24 (29.6)	.004	.950
	Yes	342 (70.8)	4.78 (5.125)			57 (70.4)		
Education	No schooling	31 (6.4)	6.10 (5.375)	3.679	.298	6 (7.4)	.206	.977
	Elementary school	167 (34.5)	5.07 (5.539)			28 (36.4)		
	Middle school	113 (23.3)	4.97 (5.417)			18 (22.2)		
	High school and above	173 (35.7)	4.38 (4.729)			29 (35.8)		
Average monthly income	None	241 (49.8)	5.49 (5.882)	3.112	.211	46 (56.8)	2.303	.316
	< 300,000 won	54 (11.2)	4.14 (4.236)			7 (8.6)		
	≤300,000 won	189 (39.0)	4.29 (4.486)			28 (34.6)		
Cognitive function	Cognitive-acceptable ( $\geq 24$ )	426 (88.0)	4.61 ± 4.93	10672.0	.045*	69 (85.2)	.739	.452
	Cognitive-impaired ( $\leq 23$ )	58 (12.0)	6.72 ± 6.78			12 (14.8)		

†: Mann-Whitney/Kruskal-Wallis test; ††:  $n = 81$  subjects who reported having suicidal ideation; \*:  $p < .05$

### 3.3. Logistic regression analysis of probable factors influencing suicidal ideation

Notably, logistic regression analysis showed that depression was the only factor we examined explaining suicidal ideation (OR = 1.49, 95% CI = 1.32 - 1.69) (Table 3.3).

**Table 3.3** Logistic regression analysis of factors influencing suicidal ideation

Variables	Categories	Suicidal ideation <sup>†</sup>	
		OR	95% CI
Depression		1.49*	1.32 - 1.69
Cognitive function	Acceptable (K-MMSE $\geq 24$ )	.312	.031 - 3.102
	Impaired (K-MMSE $\leq 23$ )		
Age		1.028	.936 - 1.129
Gender	Male	.688	.205 - 2.311
	Female		
Spouse	None	1.171	.242 - 5.676
	Have		
Residential status	Living alone	1.681	.269 - 10.511
	Living with family		
Education	Middle school and below	1.739	.615 - 4.922
	High school and above		
Religion	None	1.476	.53 - 4.087
	Have a faith		
Monthly income	None	.749	.211 - 2.658
	Have		

†Hosmer & Lemeshow test ( $\chi^2 = 11.662, p = .167$ ); \*:  $p < .001$

## 4. Discussion

This study revealed that 38.1% of older adults who visited a senior welfare centre in South Korea had mild to severe depression. Further, 16.7% and 5%, respectively, reported having suicidal ideation and thoughts of suicide every day. The prevalence of depression among older adults has previously been documented in a variety of studies. A nationwide

survey conducted by Park *et al.* (2012) reported that 27.8% of older adults in Korea suffered from depression; this rate, after accounting for differences in age, gender, education, and urbanicity, was 10.1%. In contrast, Kim and Park (2012) and Jang and Kim (2005) reported rates of 61.6% and 64.7% respectively, among those who utilized community centres in provinces and the capital, Seoul. Prior investigations have demonstrated that instruments, the local culture, and living environments can affect the prevalence of depression. Further, provinces ranked higher than cities according to the national suicide, age-standardized suicide, and suicide attempt rates. The suicide rate of Deagu, the city in which this study was conducted, was recently recorded at 27.9/100,000—lower than the national average (Korean Statistical Information Service, 2012). The results of our study suggested that depression was far more prevalent in community-dwelling Korean older adults than in American seniors receiving home meals (29%) or participating in activities at senior centres (13%) (Choi and McDougall, 2007; Sirey *et al.*, 2008). We also observed a considerably higher incidence of depression in our sample than the one noted for rural community-dwelling Japanese older adults in another recent study (20.5%) (Abe *et al.*, 2012). Considering the fact that homebound older adults have been known to be at a higher risk of developing depression than their ambulatory peers (Choi and McDougall, 2007), our findings on the prevalence of depression among community-dwelling older adults who were sufficiently able to move around and visit a senior welfare centre raised concern. Moreover, 16.7% of the participants in the present study reported having suicidal ideation. Discrepancies exist in Korean society in terms of its recognition of suicides among teenagers and older adults. This may be related to time-honoured Confucian values emphasizing respect for one's ancestors and parents, called 'Hyo' (filial piety). Kim (2002) has pointed out that Korean individuals feel very uncomfortable confronting the reality of suicide in the older generation, often preferring to overlook or avoid publicly discussing it, although suicide has been identified as the 4th leading cause of death among older adults in the country (Korean National Statistical Office, 2011). In addition, older adults in Korea tend to suppress their feelings because they consider the maintenance of emotional balance a virtue as well as a sign of maturity. Therefore, it is crucial to strengthen current social safety nets to better enable early detection and prevention of depression and suicide among the nation's older adults.

In this study, no significant associations between depression and age, gender, marital status, residential status, religion, years of education, or average monthly income were found. Differences in cognitive function, however, were related to severity of depression. Our findings, except those on residential status and gender, were consistent with observations in other studies (Abe *et al.*, 2012; Sirey *et al.*, 2008). In contrast to the findings of a previous study conducted in rural Japan (Fukunaga *et al.*, 2012), residential status was not associated with depression. This could be due to a change in perception regarding living with one's offspring. The family structure in Korea has shifted toward the nuclear family. Consequently, older adults who live alone or only with their spouses have become more common and acceptable in the last few decades. On the other hand, this shift might have also reduced Korean society's recognition of depression and suicide ideation in its older adults. The Korea Centers for Disease Control and Prevention (2009) reported that depression was 2.5-7% more prevalent in female than male older adults. In contrast, some studies found no correlation between gender and depression (Jang and Kim, 2005; Kim and Hyun, 2013).

The association between depression and cognitive function is controversial. In this study, the cognitively impaired group demonstrated significantly more severe depressive symptoms

than did the cognitively acceptable group. This result was consistent with previous studies (Ravaglia *et al.*, 2008; Stepaniuk *et al.*, 2008). Approximately 83% of mild dementia patients assessed in a study, whose MMSE scores were 15 to 23, had depression and a higher prevalence of suicidal ideation (Kim and Hyun, 2013). On the other hand, another study found no difference in the degree of depression between older adults with mild cognitive impairment and those having normal cognitive function (Shin *et al.*, 2012). It is therefore difficult to conclude if depression is a contributing factor to cognitive impairment. Nevertheless, it is important to examine both depression and cognitive function in a routine screening program for older adults.

The results of the present study indicated that being male was significantly associated with suicidal ideation, consistent with reports that suicidal deaths occurred almost twice more frequently in males (Korean Statistical Information Service, 2013). However, the logistic regression analysis showed that only depression was strongly correlated with suicidal ideation. This finding coincided with that of a previous study in which suicidal ideation was found to be associated with depression and history of suicidal attempts, but not with demographic characteristics (Shin *et al.*, 2013). Our results also suggested that demographic characteristics were not predictors of depression or suicide. Instead, we should pay more attention to understanding culture and contexts surrounding depression and suicidal ideation, such as conflicts with family, powerlessness, despair, and views on life's meaning (Im and Kim, 2012).

In general, older adults with suicidal ideation are intent on committing suicide, and tend not to reveal their suicidal intentions in advance (Conwell *et al.*, 2002). These characteristics, in addition to the fact that older adults are more fragile, more often lead to fatal outcomes. Since a considerable proportion of the older adults we screened in this study presented with depression and suicidal ideation, further timely and professional assessments and interventions are critical. In order to reduce the suicide rate among older adults, organizing suicide prevention programs like public education on depression in later life, or outreach programs that engage undiagnosed older adults with depression, needs to be a main objective, along with establishing diagnostic and treatment systems, and building collaborations among community mental health resources (Conwell *et al.*, 2002). Outreach service models at senior welfare centres promoting accessibility and use of mental health services among older adults have been examined. The effectiveness of these models has been verified in various countries including Singapore, Japan, and the United States (Ciechanowski *et al.*, 2004; Nyunt *et al.*, 2009). However, there is a lack of mental health education and counselling, community-based outreach programs for routine screening, and referrals to primary mental health care centres in Korea. The results of this study showed that even older adults who participated in social activities at senior welfare centres could be at an increased risk for suicide. Therefore, strategies to improve mental health in community-dwelling older adults through senior welfare centres should be developed.

In the interpretation and application of these findings, the fact that this study did not reflect the various characteristics of community-dwelling older adults, such as their health status, daily activities, and so on should be considered. Moreover, this study was conducted in one senior centre in a city; thus, additional regional characteristics may have an effect on the results. Therefore, further investigation in other cities nationwide is necessary.

## 5. Conclusion

The major finding of this study was the prevalence of depression, along with suicidal ideation, among ambulatory, community-dwelling older adults in Korea. This study adds to the existing literature on the high incidence of depression among the nation's older adults, which has thus far been related more with being homebound. Socio-demographic characteristics were not associated with either depression or suicidal ideation. Cognitive function and depressive symptoms were correlated, however. This study indicates the importance of developing community-based mental health programs for older adults. It also demonstrates the viability of promoting early detection of depressive symptoms through senior centres.

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