Which Type of Social Activities Decrease Depression in the Elderly? An Analysis of a Population-Based Study in South Korea

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Abstract

Background: The aim of this study was to examine whether formal and informal social activities are associated with a lower risk of depression. Besides, we investigated which type of social activities may protect against late-life depression by gender using data from a population-based study of older Korean adults.

Methods: Data for analysis were drawn from the 2010 Korean Longitudinal Study of Aging. Study sample included 3968 Korean adults aged ≥ 65 years. Depression was measured using the 10-item Center for Epidemiological Studies–Depression scale. Multivariate logistic regression analyses were used.

Results: Among the informal activities, frequent contact by phone or letters with adult children is significantly associated with a lower risk of depression among older Korean adults, even after adjusting for potentially confounding factors. Face to face contact with close friends was negatively associated with depression in women, but not in men. Face to face contacts with adult children were not significantly associated with depression. All of formal social activities (attending religious activities, volunteering, and participating in alumni society or family councils, political or interest groups) were not significantly associated with depression in both men and women.

Conclusions: Informal social activities (contact by phone/letters with children and contact with friends) may have a greater impact on geriatric depression than formal social activities in this population. Researchers need to consider gender differences when examining the relationship between social activity and depression. More research is warranted to examine the direction of associations between particular types of social activities and late-life depression across time.

Keywords: Social Activity, Depression, Gender, Elderly, Korea

Introduction

Geriatric depression is common in elderly Asians, including South Koreans (1, 2). Geriatric depression creates challenging health concerns for an increasing number of geriatric populations in Asian countries (2, 3). In South Korea alone, the prevalence of depression in elders was 16.5% (21.0% in females and 10.1% in males) and increased with age (4). Geriatric depression has been closely associated with psychological changes including anxiety, self-esteem, quality of life (QOL), and even suicide (5, 6).

Much of the researches on depression have shown that health factors, including chronic diseases, lower self-rated health, lower physical function, obesity, and cognitive decline predict risk for developing depression symptoms (3, 7-9). Social factors including age, gender, marital status, education, household income, and employment

are also associated with depression symptoms (1, 3, 7). Previous research has also shown that greater participation in social activities may protect against depression by stimulating multiple bodily systems, and reinforcing life-long patterns of attachment (2, 10). Although social activity is widely believed to protect against depression in later life, little is known about which type of social activity might be protective. Social activity can be divided into two categories based on intimacy and intensity: 1) formal and 2) informal (11). Formal activity means an activity with formal organizations like volunteer organizations and it is based on specific objectives and focuses on the achievement of a goal. On the contrary, the informal activity includes the interaction with family, friends and neighbors. It has universal character in objectives and focuses on emotional function (11, 12). Activities classified into informal activity were not the same. In later life, relationships with close friends may not be identical to those with children (13). Although both types of relationship are based on intimacy, the former is more dependent on an egalitarian relationship model and voluntarism, but the latter is dependent on a kinship model and family roles (13). Furthermore, because of differences in these relationships' general characteristics, they show different effects on elder mental health (13- 15).

Growing evidence has shown that type of social activity may differentially affect morale, life satisfaction, mental health and survival in old age (10, 12, 15). For example, a previous study reported that informal social activity with friends was significantly related to decreased mortality risk in later life after adjusting for confounding factors (16). Similarly, some researchers have indicated that contact with friends is more important to mental health than contact with children among American adults aged 60 or older (17). The other researcher found that for elderly women, morale and happiness showed a positive relationship with participation in informal activity but no significant relationship with participation in formal activity and also found that for men, morale and happiness shows no significant relationship with informal activity but a positive relationship with formal

activity (12). However, relatively little is known about the effects of type of social activities on late-life depression among Asian population.

Indeed, due to different socialization and socio-cultural norms, all types of social activity may not have a beneficial effect on late-life depression. In Asian countries, where patriarchalism and male' domination over female are common, the type of social activity beneficial to depression in old age may also be affected by gender.

The current study examined whether formal and informal social activities are associated with a lower risk of depression, and we investigated which type of social activities may protect against late-life depression by gender among older Korean adults.

Materials and Methods

Data and study population

This study used third wave data from the Korean Longitudinal Study of Aging (KLoSA). KLoSA is an ongoing panel survey examining the socioeconomic, physical, and psychological aspects of ageing among community-dwelling Koreans aged ≥ 45 years. The survey began in 2006, and data were collected every 2 years. To ensure national representation, participants were selected randomly with a multistage, stratified probability sampling design from household units selected according to geographical area, including both urban and rural areas. Before the data collection, all participants provided informed consent. In the 2010 KLoSA, a total of 7920 individuals completed interviews conducted by a skilled interviewer using a structured questionnaire. Baseline survey response rate was 80.2%. Of the data from the baseline survey, subjects who were younger than 65 years of age (n = 3670), never married, divorced, or separated (n = 44), without children (n = 82), cohabited with all children (n = 122), or had missing data on depression (n = 34) were excluded; data from the remaining 3968 subjects 65 years of age and older were used in this analyses. Sample mean age was 74.5 years (SD = 6.7, range = 65-102). Of the 3968 subjects included in the

analysis, 2267 (57.1%) were women and 1701 (42.9%) were men. Weights were assigned to reduce sampling error introduced by stratified sampling. Weights were computed in three steps: weight based on two-staged sampling probability, non-response-adjusted weight, and benchmark weight reflecting population distribution changes based on demographic changes seen in other large-scale surveys. All analyses were corrected to account for this sampling design. More sampling design details and KLoSA methods have been presented elsewhere (3, 15).

Measures

Depressive symptoms were assessed with the 10-item short-form Center for Epidemiological Studies Depression (CES-D10) Scale, which is widely used to detect depressive symptoms in non-psychiatric community settings (3, 15, 18). The CES-D10 assesses self-reported depressive symptoms experienced during the two weeks prior to testing: the scale includes two positively phrased items ("feel pretty good" and " generally satisfied") and eight negatively phrased items (e.g., "feel depressed" and "feel afraid") (15, 18). Each item is scored 0-3: (0) very rarely or less than once per day; (1) sometimes or 1–2 days during the past week; (2) often or 3–4 days during the past week; and (3) almost always or 5–7 days during the past week (3, 18). The positive phrased items were reverse-coded. Total scores ranged 0–30. Higher scores indicate more depression symptoms. In previous CES-D10 validation studies, the cutoff between moderately severe and severe depression was identified as 10 points (18). Thus, this study used the standard cutoff score of 10 to categorize individuals as depressed. Psychometric properties of the CES-D10 have been validated in previous studies (3, 15, 18). The internal consistency of the CES-D10 in the current sample was good (Cronbach's α = .87).

Social activity was divided into 1) formal, and 2) informal based on intimacy and intensity of participation required (11). We employed four variables to represent formal social activities (level of participation in church or other religious groups, level of participation in alumni society or family councils, and level of participation in volunteer groups, level of participation in political or interest groups). Participants rated how often they participated in each activity based on a 10-point scale (0, absolutely never; 1, almost never; 2, almost never a year; 3, 1–2 times a year; 4, 3–4 times a year; 5, 5–6 times per year; 6, once a month; 7, twice a month; 8, once a week; 9, 2–3 times a week; and 10, every day or almost every day). We employed three variables to represent informal social activities (level of contact by phone or letter with adult children, level of face to face contact with adult children, and level of face to face contact with close friends) (12). Participants answered the following three questions (1, how often do you contact your adult children by phone or letter?; 2, how often do you meet with your adult children?; and 3, how often do you meet with your close friends?) using a same 0-10 point scale.

Potentially confounding variables included socio-demographic variables (age, marital status, education, employment, household income, cohabitation with adult children, and place of residence) and health related variables (number of chronic diseases, body mass index (BMI), activities of daily living, instrumental activities of daily living, self-rated health, and cognitive function). Participants were also asked if they had ever been diagnosed by a physician with any chronic disease, including hypertension, heart disease (congestive heart failure or myocardial infarction), stroke, lung disease, and/or arthritis. Responses were coded 'yes' or 'no'. Number of chronic diseases was calculated by counting the number of diseases diagnosed by a physician. BMI was computed from self-reported weight and height as weight in kg divided by height in meters squared; participants were categorized as normal, overweight, or obese ($\leq$ 24.9 kg/m^2, 25.0–29.9 kg/m^2, and $\geq$ 30 kg/m^2, respectively), following WHO definitions (19). Activities of daily living (ADL) were measured with the 7-item Korean Activities of Daily Living Scale. This quantifies ability to independently perform (no help, some help, unable to do) seven activities: dressing, washing, bathing or showering, eating, getting out of bed and walking across a

room, controlling urination and defecation, and using the toilet. Instrumental activities of daily living (IADL) was assessed with the 10-item Korean Instrumental Activities of Daily Living Scale, which quantifies ability to independently perform ten activities: personal grooming, doing household chores, preparing meals, doing laundry, going out a short distance, using transportation, going shopping, managing finances, making phone calls, and taking medications. These two measures (ADL/IALD) have been widely used and are known to have acceptable reliability (15, 20). In the present study, Cronbach's internal consistency reliability of the ADL/IADL scales was 0.98 and 0.97 respectively. Respondents needing help with or unable to perform one or more activities were considered to be functionally dependent in that activity (ADL or IADL). Cognitive function was assessed with the Mini-Mental State Examination (MMSE), which has been widely used in the Korean population (7). Total score ranged 0-30. Lower scores indicated greater degree of cognitive impairment.

Statistical analyses

Subject characteristics were summarized as frequency, weighted proportions, and means (with SDs) by gender. Chi-square (χ^2) and *t*-tests were conducted to compare the distributions of socio-demographics, health related characteristics, social activities, and depressive symptoms by gender. Multivariate logistic regression analyses were conducted separately by gender to investigate any differences in relationships between depression and social activity by gender after controlling for socio-demographic and health-related variables. Odds ratios (ORs) and 95% confidence intervals (CIs) were calculated. Statistical analyses were performed with Stata (version 13, Stata Corp., College Station, TX) software. All analyses reported were two-tailed with α set at 0.05.

Results

Subject characteristics, social activities, and depression symptom levels are summarized in Ta-

ble 1. Overall, the respondents were involved in more informal social activities (contact with close friends, contact by phone or letter with children, and face to face contact with children) than formal social activities (attending religious activities, volunteering, and participating in alumni society or family councils, political or interest groups). Women had greater participation in religious activities than men. Men had greater participation in alumni society or family councils than women. Men had significantly more frequent phone and face to face contact with children than did women. Women met more frequently with close friends compared to men. Women were significantly older, more likely to be widowed, and had lower household incomes compared to men. Women also had significantly higher CES-D10 scores than men (9.24 vs.7.85; *P* < .001), and exhibited a higher prevalence of depression compared than men (18.7% vs. 10.9%; *P* < .001).

Table 2 shows the association between study variables and depression by gender. In a multivariate logistic regression model, being female (OR = 1.43 vs. male, 95% CI = 1.09–1.88, *P* = .010) was significantly associated with depression. Being age 75 or more (OR =0.73vs. 74 or less, 95% CI = 0.54–0.99, *P* = .041), being in the lowest quartile of household income (OR =1.44 vs. other quartiles, 95% CI = 1.08–1.92, *P* = .014), having ≥ 2 chronic diseases (OR = 1.35 vs. ≤1, 95% CI = 1.05–1.73, *P* = .020), being dependent in IADL (OR = 1.59 vs. independent, 95% CI = 1.06–2.37, *P* = .026), having poor self-rated health (OR = 3.30 vs. fair or good, 95% CI = 2.48–4.39, *P* < .001), and having higher MMSE scores (OR =0.95, 95% CI = 0.94–0.97, *P* < .001) were significantly associated with depression in women. Whereas, being dependent in ADL (OR = 3.02 vs. independent, 95% CI = 1.56–5.86, *P* = .001), having poor self-rated health (OR = 5.02 vs. fair or good, 95% CI = 3.05–8.24, *P* < .001), having higher MMSE scores (OR = 0.97, 95% CI = 0.95–0.99, *P* = .005) were significantly associated with depression in men.

In informal social activities, contact by phone or letters with children was negatively associated with depression for both men and women.

Table 1: Descriptive characteristics of the sample ($n = 3968$)

Variable	Women (n=2267)	Men (n=1701)	t or X²	P-value
Socio-demographics				
Age (yr), mean±SD *	74.99(6.97)	73.90(6.24)	26.849	.000
65-74	1,218(59.66)	988(66.81)		
75-74	818(32.45)	606(28.88)		
85+	231(7.89)	107(4.31)		
Marital status			756.22	.000
Bereaved	1,115(45.81)	139(7.49)		
Married	1,152(54.19)	1,562(92.51)		
Education			592.57	.000
≤Elementary school	1,878(81.22)	818(45.47)		
Middle school	205(9.92)	280(16.87)		
High school	150(7.15)	406(25.86)		
College or above	34(1.71)	197(11.80)		
Monthly household income			34.47	.000
1 quartile (lowest)	637(28.46)	349(18.45)		
2 quartile	556(25.09)	427(24.24)		
3 quartile	535(24.34)	479(28.59)		
4 quartile	511(22.11)	437(28.72).		
Employed				
No	1,880(81.31)	1,064(59.31)		
Yes	387(18.69)	637(40.69)		
Cohabitation with adult children			40.31	.000
No	1,049(63.39)	1,221(71.14)		
Yes	858(36.61)	480(28.86)		
Residential area			0.10	.751
Rural	701(32.58)	534(30.69)		
Urban	1,566(67.42)	1,167(69.31)		
Health related variables				
Number of chronic disease			92.38	.000
None	499(22.25)	582(35.13)		
1	757(33.49)	574(33.42)		
2+	1,01(44.26)	544(31.45)		
Activity of daily living			1.69	.193
Independent	2,089(93.21)	1,586(94.13)		
Dependent	178(6.79)	115(5.87)		
Instrumental Activity of daily Living			2.08	.149
Independent	1,864(83.93)	1,368(80702)		
Dependent	403(16.02)	333(19.30)		
Self-rated health			139.99	.000
Poor	1.116(46.89)	592(33.31)		
Fair	285(12.88)	438(27.25)		
Good	866(38.22)	671(39.45)		
BMI			33.74	.000
Normal	1,609(73.62)	1,358(81.76)		
Overweight	509(24.48)	285(17.64)		
Obese	40(1.90)	12(.60)		
MMSE*	19.43(7.59)	22.18(7.23)	134.357	.000
Social activities				
Formal social activity				
Level of participation in church or other religious groups, mean±SD	1.83±3.36	1.09±2.72	-7.41	.000
Level of participation in alumni society or family councils, mean±SD	0.16±0.99	0.83±1.97	13.94	.000
Level of participation in volunteer groups, mean±SD	0.04±0.54	0.05±0.61	0.86	.391
Level of participation in political or interest groups, mean±SD	0.00±0.19	0.03±0.41	2.69	.009
Informal social activity				
Level of face to face contact with close friends, mean±SD	7.54± 2.76	7.30± 2.70	2.61	.009
Level of contact by phone or letter with children, mean±SD	7.18± 1.41	7.29± 1.38	-2.47	.014
Level of face to face contact with adult children, mean±SD	5.05± 1.45	5.26± 1.48	-4.53	.000
Depressive symptoms				
CES-D score, mean±SD	9.24± 6.09	7.85± 5.75	7.30	.000
Percent of depression (CSE-D≥10)	436(18.68)	202(10.89)	38.98	.000

† %: Percent of the weighted population/ * Because of violation of homoscedasticity, the authors test the null hypothesis with fstar test.

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Table 2: Multivariate logistic regression analysis of the association between social activity and depression in Korean elderly

Socio-demographics	Total(n=3,666) AOR(95%CI) [a]	P-value	Women (n=2089) AOR(95%CI) [a]	P-value	Men (n=1,577) AOR(95%CI) [a]	P-value
Age (yr)		.063		.041		.710
74 or less	1		1		1	
75 or more	.79(.63 1.01)		.73(.54 .99)		.92(.61 1.40)	
Gender		.010				
Man	1					
Woman	1.43(1.09 1.88)					
Marital status		.267		.138		.814
Bereaved	1		1		1	
Married	.86(.67 1.12)		.81(.61 1.07)		.92(.45 1.87)	
Education		.525		.661		.709
≤ elementary school	1		1		1	
>elementary school	.91(.69 1.21)		.92(.63 1.34)		.92(.60 1.42)	
Monthly household income		.012		.014		.529
>1 quartile	1		1		1	
≤1 quartile	1.37(1.07 1.75)		1.44(1.08 1.92)		1.16(0.73 1.86)	
Employed		.050		.303		.085
No	1		1		1	
Yes	.73(.53 1.00)		.81(.54 1.21)		.62(.36 1.07)	
Cohabitation with adult children		.921		.693		.253
No	1		1		1	
Yes	.99(.78 1.26)		.94(.71 1.26)		1.29(.83 1.99)	
Residential area		.307		.486		.577
Rural	1		1		1	
Urban	.88(.68 1.13)		.90(.66 1.22)		.87(.55 1.40)	
Health variables						
Number of chronic disease		.329		.020		.065
≤1	1		1		1	
≥ 2	1.11(.90 1.38)		1.35(1.05 1.73)		.66(.43 1.03)	
Activity of daily living		.045		.862		.001
Independent	1		1		1	
Dependent	1.50(1.01 2.22)		1.05(.64 1.72)		3.02(1.56 5.86)	
Instrumental Activity of daily Living		.040		.024		.458
Independent	1		1		1	
Dependent	1.40(1.02 1.92)		1.59(1.06 2.37)		1.22(.72 2.07)	
Self-rated health		.000		.000		.000
Fair or Good	1		1		1	
Poor	3.77(2.95 4.82)		3.30(2.48 4.39)		5.02(3.05 8.24)	
BMI		.260		.159		.713
Normal	1		1		1	
Overweight or Obese	1.15(.90 1.48)		1.23(.92 1.64)		.91(.53 1.53)	
MMSE Scores	.96(.94 .97)	.000	.95(.94 .97)	.000	.97(.95 .99)	.005
Social activity						
Formal social activity						
Level of participation in church or other religious groups	1.00(.97 1.04)	.804	1.00(.89 .97)	.871	1.01(.93 1.09)	.875
Level of participation in alumni society or family councils	1.03(.95 1.13)	.447	1.08(.95 1.24)	.238	1.02(.92 1.14)	.686
Level of participation in volunteer groups	1.13(.93 1.37)	.228	1.18(.93 1.49)	.168	1.01(.77 1.31)	.950
Level of participation in political or interest groups	1.04(.76 1.41)	.812	-	-	1.08(.80 1.47)	.609
Informal social activity						
Level of face to face contact with close friends	.93(.90 .97)	.000	.92(.88 .97)	.000	.94(.88 1.01)	.114
Level of contact by phone or letter with children	.84(.77 .92)	.000	.88(.79 .97)	.010	.79(.67 .94)	.006
Level of face to face contact with adult children	1.05(.96 1.15)	.249	1.04(.93 1.15)	.514	1.08(.92 1.26)	.358

After adjusting for covariates, old adults with more frequent contact by phone or letters with children had significantly less ORs of depression (OR=0.79, 95% CI = 0.67–0.94, *P*= .007, in men; OR=0.88, 95% CI = 0.79–0.97, *P*= .011, in women) compared with those who did not. Face to face contact with close friends was negatively associated with depression in women (OR = 0.93, 95% CI = 0.89–0.97, *P* = .001), but not in men (OR = 0.95, 95% CI = 0.88–1.02, *P* = .147). Face to face contact with adult children was not significantly associated with depression in both men and women. All of formal social activities (attending religious activities, volunteering, and participating in alumni society or family councils, political or interest groups) were not significantly associated with depression in both men and women.

Discussion

We found a significant, negative association between contact by phone or letters with adult children and depression in both men and women. After controlling for relevant confounders, the rate of depression among old adults with more frequent contact by phone or letters with children was 0.79 times lower than those who did not. This result supports previous findings that frequent contact by phone or letter with adult children enhanced the morale among older Koreans (12), and former reports showing talking on the phone with family was an important social activity, assisting the notion that intimacy is needed for psychological well-being (21, 22). The receipt of emotional support may moderate the health-related stressors, leading to depression (23, 24), whereas loneliness or isolation may worsen psychological health in older adults (25). As a result of urbanization and westernized lifestyle during recent decades, many Koreans do not live with their parents anymore. The numbers of elderly living alone and empty nest families in South Korea are on the rise (26). Talking on the phone with children may provide older adults emotional support and a feeling of caring. Emotional support from adult children using phone or letters seems to play a crucial role in maintaining mental health in later life. Face to face contact with close friends was negatively

related with depression in women, but not in men. The rate of depression among women who met frequently with friends was 0.9 times lower than for women who did not after adjustment for confounding factors. This finding is in line with previous research reporting contact with friends was significantly protective against a decline in mental health among older persons (27, 28), and another study reporting gregarious social networks were associated with lower level of depression symptoms (29). Through contact with close friends, older adults may feel less lonely, and be more likely to receive emotional support, an important shield against depression (29). In the present study, there was a gender difference in the impact of contact with close friends on depression. Previous evidence has shown that women, compared to men, are more likely to seek and receive more emotional support from friends, which can contribute to the development of intimate relationships and protect them from developing depressive symptoms (30). On the other hand, men are not accustomed to expressing emotion interpersonally and are not likely to pour out their worries to friends (12). A study of a population-based study of Norwegian adolescents also reported that social support from friends moderate depressive symptoms in girls, but not boys (31). Thus, contact with friends seems to have no effects on depression in men. The gender difference in behaviors on friend relationship can be one of reasons to explain the results.

Face to face contact with adult children was not significantly associated with depression in either men or women. This may be because favorable effects of the contacts with children on depression might be due to offset by adverse effects. In Asian cultures where parent-children interaction is highly valued, when adult children request, most of older adults meet their adult children and provide help (14, 15). Previous research in Asian countries has reported that the burdens of helping adult children may be detrimental to the psychological health of older adults (32). Close family relationships was related with greater stress in older women (14). Conversely, a study among the Japanese elderly reported that co-residence with children or close interaction with children

was associated with low prevalence of depression and good self-perceived health (33). Another study among the European elderly also showed that few contacts with children had a negative effect on the mental health of elderly parents (34). More research is needed on impacts of the contacts with children on depression among Asian older people.

All of formal social activities were not significantly associated with depression in both men and women. This may be due to the low statistical power to detect the relationship due to the low level of participation in formal activities. Previous evidence has shown that Asians tend to have a family-oriented culture, and Asian older adults tend to participate in fewer formal social activities than western older adults (21). In the present study, most subjects did not participate in various formal social activities. The majority of participants took part in only one type of formal social activity, or was not involved at all. These results suggest that informal social activities may have a greater impact on geriatric depression than formal social activities in this population. A positive association between depression and worse self-rated health is consistent with previous research, as were other factors (female gender, age, low income, functional limitations, physical disease, and cognitive impairment) (1, 3, 7-9).

Several limitations should be taken into account. First, this study was based on a cross-sectional survey, which cannot generate inferences regarding causality. Second, social activities were self-reported, which may be prone to errors of recall. Third, existing research has shown that quality rather than quantity of social interaction better predicts health outcomes (35). However, our social activity measures did not evaluate quality. In future research, integrated instruments assessing quantity and quality of social activity need to be employed in order to obtain more accurate information about the relationship of social activity to geriatric depression. Finally, the participants of this study were comparatively healthy community-dwelling people. Thus, the findings cannot be generalized to hospitalized elderly patients.

Despite these limitations, this study adds to previous work on depression in older people, offering convincing evidence for which type of social activities may protect against late-life depression using a large, nationally representative sample of the Korean elderly. This study also highlights the importance of considering gender differences in the relationship between type of social activity and geriatric depression.

Conclusions

The current study showed that some informal social activities (contact by phone/letters with children and contact with friends) were associated with a lower risk of depression, but formal social activities were not. Contact by phone/ letters with adult children could be protective factors against depression among older Korean adults. Social activities revolving around one's close friends also could protect against depression in old women. Our findings of a protective impact of social activity on late-life depression are compatible to that found in previous works. Future research is needed to examine the direction of associations between particular types of social activities and late-life depression across time, and researchers need to consider gender differences when examining the relationship between social activity and depression.

Ethical considerations

Ethical issues (Including plagiarism, Informed Consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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