보건학석사 학위논문

Association between Social Integration and Suicidal Ideation among the Elderly in Southwestern Part of Seoul, Korea

서울시 서남부 지역 노인들의 사회참여와 자살 생각

2014년 8월

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보건학과 보건학 전공
최 진 아

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이 논문을 보건학 석사학위논문으로 제출함

2014년 4월

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최진아의 석사학위논문을 인준함

2014년 6월

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Abstract

Association between Social Integration and Suicidal Ideation among the Elderly in Southwestern Part of Seoul, Korea

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Background: Late-life Suicide has increased rapidly over the past 20 years and become an important issue for public health in Korea. Hence, understanding of contributing risk and protective factors is priority and there are growing interests in social integration to reduce suicidal ideation. This study examines types of social participation and social network in Korean society and identifies the process through which types of social participation and social networks influence the degree of suicidal ideation across sex.

Methods: This study used data from the 2013 Korean Community Health Survey. The sample was limited to adults aged 65 or above residing in 8 communities in Seoul and was categorized into two groups by respondents' gender (543 male, 668 female). Questions were asked to evaluate suicidal ideation focusing on social participation,

social networks, socio-demographics, perception variables. Three dimensions of social participation were identified according to the survey – religious involvement, friendship network and leisure activity. Three components of social network were analyzed- family, friends and neighbors.

Results: In elderly men, only no friendship network was statistically significant to increase suicidal ideation after adjustments of socio-demographics and perception variables (OR=2.22, 95% CI=1.07, 4.64). The strong association in elderly women exists between suicidal ideation and social network for neighbors and family in positive way after adjustment of socio-demographics. Stress and depression were related to suicidal thoughts in both men and women, whereas marital status was associated with suicidal ideation only in men.

Conclusion: This research shows that social integration is a modest independent correlate of suicidal ideation. It is necessary to provide gender-specific social support to prevent suicide.

Keywords: Social participation, Social network, Suicide ideation

Student Number: 2012-23731

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Chapter 1. Introduction

Elder's suicide is one of the most serious public health problems. The number of suicides in South Korea reaches 15,906 in 2011 and Statistics Korea published alarming numbers related to the incidence of suicide with an average rate of 31.7/100,000 (Statistics Korea, 2012), which is remarkably higher than average suicide rate for Organization for Economic Co-operation and Development (OECD) member countries (12.9/100,000) (OECD, 2011). Especially, Suicide rates among the elderly continue to rise dramatically. The suicide rate for the sixties was 50.1/100,000 and 84.4/100,000 for the seventies. The eighties are at even greater risk with rates of 116.9/100,000 (Statistics Korea, 2012). Like this, elders have higher suicide rates than any other age groups and South Korea has the highest senior deaths from suicide among the OECD member countries (OECD, 2011). These trends are expected to get worse as the proportion of elderly people increases rapidly. Thus, it is important to understand the prevalence and associated factors of suicide ideation in order to prevent future suicides.

Most research about elderly suicide focused on seeking causes of suicide in preventive level and there are two major aspects: One is individual level that considers age, gender, marital status, socioeconomic status, smoking, drinking, psychological and physical diseases and social isolation(Han & Lee, 2012; Heisel, Duberstein, Talbot, King, & Tu, 2009; Taylor, Grande, Gill, Fisher, & Goldney, 2007). Those who are older, poor, from a low income family, male, with inappropriate social support resources and physical disabilities, and living alone have higher suicidal tendencies(Y.-C. Yen et al., 2005). Nevertheless, suicide is a complicated issue. Suicide itself is an individual behavior but it is influenced by social integration since people in a society are connected to each other in social networks (S. M. Park, S. I. Cho, & S. S. Moon, 2010; Ra & Cho, 2013). Therefore,

we should consider individual factors as well as a range of social factors in attempts to explain suicide and suicide behavior(S. Park, S. Cho, & S. Moon, 2010). The degree of social integration is significantly associated with the prevalence of elderly suicide. When the degree of social inequality notes greater, the rate of suicide gets higher (Burr, Hartman, & Matteson, 1999). Social inequality causes social opposition, which corrupts social integrity and leads to more depression and suicidal tendencies(Willis, Coombs, Cockerham, & Frison, 2002). Thus, it is not difficult to infer that the effect of the neighborhood and community on elderly mental health is obvious and it is important to interpret elder's suicide behavior at the community level as well. Even given the importance of a community level on various individual's health outcomes, only few previous studies have examined its association with suicide.

People experience a sense of loss due to retirement, bereavement and empty nest in later life (Choi & Jang 2005). These lifespan characteristics act as weaknesses to mental health of elder people. In fact, 15% of elder people appeal mental health problem like depression(오인근, 오영삼, & 김명일, 2009). In previous researches, psychological and health problems such as depression mentioned above considered as major factors to induce senior suicide(신학진, 2012; 윤현숙 & 구본미, 2009). With these concerns, senescence is accentuated as the lifespan which is vulnerable to suicide psychosocially.

Suicide is a continuum of behavioral process. The spectrum of suicidal behavior lies from suicidal ideation to actual attempts and finally to completed suicide(Kang et al., 2014). Suicide ideation is closely connected to more severe suicidal behavior and acts as a vital predictor for suicide attempt and completion(Posner et al., 2011). Thus, ideation should be regarded as an important phase in the suicide process, anteceding suicide attempts and completed suicide(Hintikka et al., 1998).

The risk factors of suicidal ideation include mood disorders, particularly depression and a low self-esteem and negative life events(Kim & Kim, 2008). Other factors include physical illness, pain, poor self-perceived health, functional impairments, lack of reasons for living, high level of stress, relationship, unemployment and lower level of hope (CASEY et al., 2006; Kumar et al., 2012). On the other hand, social support, self-continuity, self-appraisals, self-worth, self-efficiency, depending on religious and moral beliefs, relationship with family and peers, a sense of coherence and a sense of belonging are reported to be the protective factors of suicidal behavior(CASEY et al., 2006; 김현정 & 황의갑, 2011). Thus, it is noticeable that a few of the protective factors are derived from social integration.

The term social engagement refers to a socially-oriented sharing of individual resources and an important factor as an indicator of social integration(Phillips, 1967). Social participation is the link between individuals and the context of membership or interaction in a group. Through the social participation, the community could optimize its social capital and subsequently improve the health of its residents. Social participation will also strengthen a sense of mutual trust, build up social norms and values, and produce social support in one's living community (Kawachi, Kennedy, & Glass, 1999; Kawachi, Kennedy, Lochner, & Prothrow-Stith, 1997; Kawachi, Kennedy, & Wilkinson, 1999). The social network, with its plentiful resources, will not only create positive benefit but also improve individual health: well-being, happiness(Phillips, 1967), reduced stress (Rietschlin, 1998) or a lower risk of death(Hyyppa & Maki, 2001, 2003). By way of dynamic interaction, various resources and feedback can be obtained. Thus, participating in social activities is important to the individual's mental health.

In a recent review, Rurup et al. (Rurup, Deeg, Poppelaars, Kerkhof, & Onwuteaka-Philipsen, 2011) examined the effects of social network and loneliness on suicide ideation. The author

reported that when controlling for depression, small size of social networks and loneliness were positively related with suicide ideation. In another review, social disconnectedness was stated as a main risk factor for suicide with depression, somatic diseases and functional impairment based on the interpersonal theory of suicide(Van Orden & Conwell, 2011). Based on the result, the authors have recommended that increasing connectedness and enhancing psychotherapy based on interpersonal and social issues in old people with high risk of suicide are the best preventive strategies.

Based on existing research, social integration and support may play a role in suicidality in older people. The most common approaches associated with interpersonal support and social isolation are cognitive-behavioral approaches to encourage adaptation to retirement(Lapierre, Dube, Bouffard, & Alain, 2007), online emotional support to pursue perceived social support(DE LEO, BUONO, & DWYER, 2002) or interpersonal psychotherapy(Heisel et al., 2009). These approaches are in line with Durkheim's initial work on the importance of social integration for the best physical and mental health.

Older adults experience drastic cut of social network so that substitution for social network and social participation that is able to complement role identification are raised as an important issue. Nevertheless, few studies have examined social isolation and social integration as a target for preventive actions in the elderly. Besides, little is known about the role of gender in the relationship between social integration and suicidal ideation in older adults.

The aim of this paper is to contribute to explore the impact of social participation and social networks on suicide ideations in older people and to determine significant inter-relationship among them, using data from the Korean Community Health Survey (2013). Major hypotheses of this study were as follows: First, lack of social participation in older people would be strongly associated with

occurrence of suicidal ideation. Second, suicidal ideation in older people would be influenced by the type of social participation. Third, individuals with small network would be related to a greater likelihood of reporting suicide ideation than those with large network. Lastly, gender differences exist in the relationship between social integration and suicidal ideation among older adults. Based on the result, future elderly suicide preventive interventions could be designed and implemented accordingly in the community setting.

Chapter 2. Methods

2-1 Study design and population

This study was designed to explain the relationship between

social integration and suicidal ideation for older people in Korea. Each variable will be analyzed respectively in order to confirm which type of social participation and social network influence suicidal ideation. This cross-sectional study was based on the data gained from part of Korean Community Health Survey (CHS) carried out in 2013. The CHS is a nationwide survey conducted annually by public health centers from each 253 community district throughout Korea in cooperation with the Korea Center for Disease Control (KCDC) and universities across the nation. However, in this study, the region was restricted to 8 community districts in Seoul: Gangseo, Gwanak, Guro, Geumcheon, Dongjak, Mapo, Yangcheon and Yeongdeungpo. These areas are southwestern part of Seoul. To explore elderly suicide ideation and associated factors, all 1,211 adults aged 65 and above were selected to be included in the analyses.

2-2 Data collection

Korean Community Health Survey (2013)

The CHS, first started in 2008, is an annual national cross-sectional survey carried out between August and October. This was one of the most representative population-based health and social behaviors survey in Korea. It estimates community health conditions by measuring prevalence of behavioral risk factors for each community unit so that health statistics for implementing evidence-based health policies can be produced. To obtain a representative sample for the CHS, subjects were randomly selected and notified by mail to participate in the survey. On average, 900 subjects (within 450 households), 19 years of age or older, were selected from each district. The survey was administered by interviewers who were trained to ensure standardization of interview procedures and

protocol. After a full explanation of the study, all participants provided formal written informed consent at interview. All data collection was undertaken via computer-assisted personal interview (CAPI) and all interviews were conducted on a face-to face basis. The questionnaire consists of 18 domains and 258 questions, including health behaviors, morbidity, injuries, quality of life, vaccinations, usage of health services, as well as people's perception of social environment and socio-demographics.

2-3. Measures

Independent Variables

- Socio-demographics -

Survey items were composed of demographic characteristics including age, educational attainment, marital status, living arrangement and household income. Age was categorized into two groups: (1) 65-74[reference category], (2) 75 and over. Educational-attainment was classified into four categories: (1) below elementary school, (2) middle school, (3) high school and (4) college or above [reference category]. Marital status was grouped into two categories: (1) married [reference category] and (2) single/divorced/separated/widowed. Living status was divided into two categories: (1) alone and (2) not alone [reference category]. Household income was recoded as: (1) below 100, (2)100-199, (3)200-399 and (4)400 or above, where units are in ten-thousand Korean Won.

- Perception Variables -

Perception variables were also considered. Perceived health was measured by asking the respondents to rate their health status, using a 5-point Likert scale from very good to very poor. Two dummy variables were created with the value 2 indicating very good/good, value 1 indicating fair and value 0 indicating poor/very

poor. Stress was measured by making the respondents to select an option for the statement: 'How much level of stress do you feel during daily life?' using a 4-point scale (from 'none' to 'severe'). Then, the respondents were categorized into two groups: 0= none or mild, 1= moderate or severe). The depression was assessed by asking, 'have you experienced persistent feelings of sadness or depression, sufficient to influence daily life for two weeks and over during the past year?' using a two-point scale: Yes or No.

- Social integration -

Respondents' social participation level was measured by their involvement in three different activity types (religious involvement, friendship networks and leisure activity). Each item was assessed by using a dichotomous answer (Yes/No).

Social network was evaluated through frequency in regular contact with the family, neighbors and friends. If respondents communicate with others (family, neighbors or friends) 'less often than once a month', 'once a month' or 'two or three times a month', they are considered to have low social network. If they keep in touch with others 'more than once a week', they are considered to have high social network. One dummy variable was created with the value 0 indicating low social networks, value 1 indicating high social networks for each family, neighbors and friends.

Dependent Variable: Suicide Ideation

The dependent variable for the current study was suicidal ideation. The participants were asked to answer the following question: 'Have you ever seriously thought about committing suicide in the past year?' The options for this question were 'yes' (coded=1) or 'no' (coded=0).

2-4. Statistical Analysis

First of all, descriptive statistics were used to summarize the data and chi-squared test for the sample population and suicidal ideation was conducted to compare the distribution of subjects in each category across explanatory variables. To investigate the relationship between independent variables and suicide ideation, logistic regression analysis was used. The data were initially assessed using univariate analysis with the outcome. Because socio-demographic variables could be confounding variables for all other covariates, socio-demographic variables-adjusted odds ratios were calculated from a logistic regression model. Associated factors in the univariate analyses were then entered into multivariate logistic regression models to investigate independence. The reported odds ratio and its 95% confidence interval were derived from multivariate models: model1-model2. All statistical analyses were carried out using SAS 9.3 software.

Chapter.3 Results

Table 1 shows the general socio-demographic and health related characteristics of the study population from 2013 CHS. Among the total of 1,211 subjects from 8 communities, 543 were men (44.8%) and 668 were women (55.2%). In both gender groups, education, perceived health, stress, depression, friendship network displayed significant association with suicidal thoughts. Whereas marital status, living arrangement, leisure activities and social networks for friends were significantly related to suicidal ideation only in elderly men, household income, social networks for family and neighbors were significantly associated with suicidal ideation only in elderly women. Age and religious involvement did not distinguish participants with and without suicidal ideation in both genders (Table 1).

Suicide ideation was present in 13.3% (men) and 21.0% (women) of the CHS sample (Table 2). The proportion of elderly women reporting having experienced suicidal ideation was significantly higher than that of elderly men, consistent with previous finding.

Table 1. Differences in Suicidal Ideation according to Sociodemographics and Health related Characteristics of Subjects N=1,211

Characteristics	Men			Women		
	N(%)	Suicidal ideation n(%)	p-value	N(%)	Suicidal ideation n(%)	p-value
Total	543	72(13.3)		668	140(21.0)	
Age						
65-74	394(72.6)	48(12.2)	0.229	456(68.3)	90(19.7)	0.255
≥75	149(27.4)	24(16.1)		212(31.7)	50(23.6)	
Education						
≤Elementary school	162(29.8)	32(19.8)		461(69.2)	119(25.8)	
Middle school	104(19.2)	13(12.5)	0.030	88(13.2)	11(12.5)	<0.0001
High school	168(30.9)	16(9.5)		83(12.5)	6(7.2)	
≥College	109(20.1)	11(10.1)		34(5.1)	4(11.8)	
Marital status						
Married	474(87.4)	56(11.8)	0.0078	300(44.9)	61(20.3)	0.720
Divorced/Separated/Widowed/Single	68(12.6)	16(23.5)		368(55.1)	79(21.5)	
Living Arrangement						
Alone	45(8.3)	12(26.7)	0.0056	151(22.6)	38(25.2)	0.149
Not alone	498(91.7)	60(12.1)		517(77.4)	102(19.7)	
Household income						
<100	125(24.0)	23(18.4)		207(32.7)	62(30.0)	
100-199	153(29.4)	18(11.8)	0.083	167(26.4)	30(18.0)	0.0012
200-399	158(30.4)	14(8.9)		148(23.4)	23(15.5)	
≥400	84(16.2)	14(16.7)		111(17.5)	17(15.3)	
Perceived health						
Good	147(27.1)	10(6.80)	<0.0001	99(14.8)	10(10.1)	<0.0001
Fair	239(44.0)	22(9.21)		262(39.2)	37(14.1)	
poor	157(28.9)	40(25.5)		307(46.0)	93(30.3)	
Stress						
No	443(81.6)	41(9.26)	<0.0001	493(73.8)	62(12.6)	<0.0001
Yes	99(18.2)	31(31.3)		175(26.2)	78(44.6)	
Depression						
No	497(91.5)	39(7.85)	<0.0001	582(87.1)	77(13.2)	<0.0001
Yes	46(8.5)	33(71.7)		86(12.9)	63(73.3)	
Social participation						
Religious involvement			0.065			0.196
No	355(65.4)	54(15.2)		297(44.5)	69(23.2)	
Yes	188(34.6)	18(9.57)		371(55.5)	71(19.1)	
Friendship network						
No	248(45.7)	51(20.6)	<0.0001	361(54.0)	87(24.1)	0.031
Yes	295(54.3)	21(7.12)		307(46.0)	53(17.3)	
Leisure activities						
No	395(72.7)	60(15.2)	0.03	578(86.5)	127(22.0)	0.103
Yes	148(27.3)	12(8.11)		90(13.5)	13(14.4)	
Social Networks						
Family						
High	236(43.5)	26(11.0)	0.177	353(52.9)	60(17.0)	0.007
Low	307(56.5)	46(15.0)		314(47.1)	80(25.5)	
Neighbors						
High	266(49.0)	37(13.9)	0.662	417(62.5)	76(18.2)	0.024
Low	277(51.0)	35(12.6)		250(37.5)	64(25.6)	
Friends						
High	259(47.7)	26(10.0)	0.035	302(45.3)	62(20.5)	0.791
Low	284(52.3)	46(16.2)		365(54.7)	78(21.4)	

Table 2. Differences in Suicidal Ideation by Sex N=1211

Characteristics	Men (n=543)	Women (n=668)	p-value
	n(%)	n(%)	
Suicidal ideation			
No	471(86.7)	528(79.0)	0.0005
Yes	72(13.3)	140(21.0)	

Table 3. Odds Ratio of Risk Factors Associated with Suicidal Ideation in Elderly by Sex N=1211

Characteristics	Men			Women		
	N (%)	OR (95% CI)	p-value	N (%)	OR (95% CI)	p-value
Age						
65-74	394(72.6)	1	0.230	456(68.3)	1	0.256
≥75	149(27.4)	1.38 (0.814-2.35)		212(31.7)	1.26 (0.848-1.86)	
Education						
≤Elementary school	162(29.8)	**2.19 (1.05-4.57)**	0.005	461(69.2)	2.61 (0.901-7.56)	<0.0001
Middle school	104(19.2)	1.27 (0.543-2.98)	0.998	88(13.2)	1.07 (0.316-3.63)	0.856
High school	168(30.9)	0.94 (0.418-2.11)	0.186	83(12.5)	0.58 (0.154-2.22)	0.063
≥College	109(20.1)	1		34(5.1)	1	
Marital status						
Married	474(87.4)	1		300(44.9)	1	
Divorced/Separated/Widowed/Single	68(12.6)	**2.29 (1.23-4.30)**	0.009	368(55.1)	1.07 (0.736-1.60)	0.720
Living status						
Alone	45(8.3)	**2.66 (1.30-5.42)**	0.007	151(22.6)	1.37 (0.893-2.10)	0.150
Not alone	498(91.7)	1		517(77.4)	1	
Household income						
<100	125(24.0)	1.13 (0.543-2.34)	0.077	207(32.7)	**2.36 (1.30-4.29)**	<0.0001
100-199	153(29.4)	0.67 (0.313-1.42)	0.670	167(26.4)	1.21 (0.632-2.32)	0.670
200-399	158(30.4)	0.49 (0.220-1.08)	0.049	148(23.4)	1.02 (0.515-2.01)	0.195
≥400	84(16.2)	1		111(17.5)	1	
Perceived health						
Good	147(27.1)	1		99(14.8)	1	
Fair	239(44.0)	1.38 (0.634-3.00)	0.126	262(39.2)	1.46 (0.698-3.07)	0.236
poor	157(28.9)	**4.65 (2.23-9.70)**	<0.0001	307(46.0)	**3.89 (1.93-7.81)**	<0.0001
Stress						
No	443(81.6)	1		493(73.8)	1	
Yes	99(18.2)	**4.46 (2.62-7.60)**	<0.0001	175(26.2)	**5.58 (3.74-8.32)**	<0.0001
Depression						
No	497(91.5)	1		582(87.1)	1	
Yes	46(8.5)	**29.7 (14.5-61.1)**	<0.0001	86(12.9)	**18.8 (10.9-32.3)**	<0.0001
Social participation						
Religious involvement						
No	355(65.4)	1.69 (0.962-2.98)	0.068	297(44.5)	1.28 (0.880-1.86)	0.197
Yes	188(34.6)	1		371(55.5)	71(19.1)	
Friendship network						
No	248(45.7)	**3.38 (1.97-5.80))**	<0.0001	361(54.0)	**1.52 (1.04-2.23)**	0.031
Yes	295(54.3)	1		307(46.0)	1	
Leisure activities						
No	395(72.7)	**2.03 (1.06-3.89)**	0.033	578(86.5)	1.67 (0.897-3.10)	0.106
Yes	148(27.3)	1		90(13.5)	1	
Social Networks						
Family						
High	236(43.5)	1		353(52.9)	1	
Low	307(56.5)	1.42 (0.851-2.38)	0.178	314(47.1)	**1.67 (1.15-2.43)**	0.008
Neighbors						
High	266(49.0)	1		417(62.5)	1	
Low	277(51.0)	0.90 (0.545-1.47)	0.662	250(37.5)	**1.54 (1.06-2.25)**	0.024
Friends						
High	259(47.7)	1		302(45.3)	1	
Low	284(52.3)	**1.73 (1.04-2.90)**	0.036	365(54.7)	1.05 (0.723-1.53)	0.791

To explore specific relationship between social integration and suicide ideation, univariate logistic regression analyses were performed (Table 3).

The result demonstrated that lack of social participation and social network were significantly associated with suicidal ideation in both men and women. A striking feature was the role of friendship network, which was significant for both genders. Having no friendship network showed a serious effect on suicidal ideation (OR in men=3.38, 95% CI=1.97, 5.80, OR in women=1.52, 95% CI=1.04, 2.23). Not participating in leisure activities was significantly associated with suicidal thoughts only in men (OR=2.03, 95% CI=1.06, 3.89). Also, low social network for friends was associated with increased likelihood of suicide ideation in men (OR=1.73, 95% CI=1.04, 2.90), whereas low social network for family and neighbors was associated with increased risk of suicide ideation in women (OR=1.67, 95% CI=1.15-2.43, OR=1.54, 95% CI=1.06-2.25).

Among socio-demographic variables, elderly men who had attained an educational level of below elementary school reported higher suicidal ideation (OR=2.19, 95% CI=1.05, 4.57). Divorced/separated/widowed/single status was associated with suicidal thoughts in men (OR=2.29, 95% CI=1.23, 4.30). Living alone was related to suicidal ideation in men (OR=2.66, 95% CI=1.30, 5.42).

Additionally, for the perception variables, severe stress was significantly associated with suicidal thoughts in both genders (OR in men=4.46, 95% CI=2.62, 7.60, OR in women=5.58, 95% CI=3.74, 8.32). Experiencing depression affected the suicidal ideation of both sexes (OR in men=29.7, 95% CI=14.5, 61.1, OR in women=18.8, 95% CI=10.9, 32.3). Poor perceived health was associated with increased risk of suicidal ideation in both genders (OR in men=4.65, 95% CI=2.23, 9.70, OR in women=3.89, 95% CI=1.93, 7.81).

Table 4. Adjusted Odds Ratio of Risk Facors Associated with Suicidal Ideation in Elderly Men N=543

Characteristics	Model 1 Adjusted OR (95% CI)	Model 2 Adjusted OR (95% CI)
Social integration		
Social participation		
Religious involvement		
No	1.46(0.784-2.70)	1.65(0.770-3.53)
Yes	1	1
Friendship network		
No	**2.78(1.50-5.16)**	**2.22(1.07-4.64)**
Yes	1	1
Leisure activities		
No	1.08(0.517-2.24)	0.69(0.292-1.62)
Yes	1	1
Social Networks		
Family		
High	1	1
Low	1.30(0.737-2.30)	1.95(0.958-3.95)
Neighbors		
High	1	1
Low	0.78(0.453-1.36)	0.71(0.366-1.38)
Friends		
High	1	1
Low	1.40(0.789-2.49)	1.37(0.680-2.78)
Socio-demographics		
Age		
65-74	1	1
≥75	1.02(0.559-1.85)	1.34(0.652-2.76)
Education		
≤Elementary school	1.36(0.590-3.12)	1.39(0.520-3.70)
Middle school	0.92(0.356-2.39)	0.92(0.297-2.88)
High school	0.91(0.374-2.20)	0.72(0.252-2.06)
≥College	1	1
Marital status		
Married	1	1
Divorced/Separated/Widowed/Single	1.82(0.620-5.34)	**3.35(1.00-11.2)**
Living status		
Alone	1.43(0.403-5.04)	0.77(0.176-3.39)
Not alone	1	1
Household income		
<100	0.71(0.306-1.65)	0.63(0.227-1.75)
100-199	0.58(0.254-1.31)	0.50(0.185-1.34)
200-399	0.51(0.221-1.18)	0.64(0.247-1.68)
≥400	1	1
Perception variables		
Perceived health		
Good		1
Fair		1.40(0.554-3.53)
poor		1.98(0.774-5.09)
Stress		
No		1
Yes		**2.14(1.04-4.42)**
Depression		
No		1
Yes		**26.9(11.0-65.8)**
Hosmer & Lemeshow Goodness-of-Fit Test	0.850	0.522

Table 5. Adjusted Odds Ratio of Risk Facors Associated with Suicidal Ideation in Elderly Women N=668

Characteristics	Model 1 Adjusted OR (95% CI)	Model 2 Adjusted OR (95% CI)
Social integration		
Social participation		
Religious involvement		
No	1.05(0.694-1.59)	0.97(0.594-1.58)
Yes	1	1
Friendship network		
No	1.14(0.725-1.81)	0.96(0.561-1.66)
Yes	1	1
Leisure activities		
No	1.50(0.680-3.29)	1.04(0.427-2.53)
Yes	1	1
Social Networks		
Family		
High	1	1
Low	**1.54(1.02-2.32)**	1.42(0.870-2.31)
Neighbors		
High	1	1
Low	**1.66(1.09-2.53)**	1.57(0.958-2.59)
Friends		
High	1	1
Low	0.89(0.574-1.37)	0.70(0.420-1.18)
Socio-demographics		
Age		
65-74	1	1
≥75	1.10(0.701-1.73)	1.12(0.650-1.91)
Education		
≤Elementary school	2.44(0.685-8.72)	2.56(0.610-10.7)
Middle school	0.87(0.206-3.65)	0.73(0.145-3.70)
High school	0.71(0.159-3.14)	1.08(0.210-5.57)
≥College	1	1
Marital status		
Married	1	1
Divorced/Separated/Widowed/Single	0.72(0.430-1.21)	0.84(0.457-1.56)
Living status		
Alone	1.11(0.584-2.10)	1.25(0.579-2.72)
Not alone	1	1
Household income		
<100	1.92(0.956-3.85)	1.58(0.690-3.60)
100-199	1.25(0.624-2.51)	0.90(0.395-2.05)
200-399	0.99(0.485-2.02)	1.01(0.440-2.31)
≥400	1	1
Perception variables		
Perceived health		
Good		1
Fair		1.69(0.700-4.06)
poor		2.25(0.98-5.18)
Stress		
No		1
Yes		**3.03(1.83-5.02)**
Depression		
No		1
Yes		**12.6(6.53-24.4)**
Hosmer & Lemeshow Goodness-of-Fit Test	0.872	0.138

Table 4 and 5 shows the results from the multivariate logistic regression models. Model1 consisted of only socio-demographic and social integration variables. In model 1, no friendship network was found to be significantly associated with suicide ideation in elderly men (OR=2.78, 95% CI=1.50, 5.16). For elderly women, low social network for family and friends was significantly related to increased suicidal ideation in model 1 (OR for family=1.54, 95% CI=1.02, 2.32, OR for friends=1.66, 95% CI=1.09, 2.53). Model 2 added perception variables to the model 1 and considered all variables simultaneously. There were slight changes in odds ratios and statistically significant associations. In model 2, no friendship network remained significant to suicidal ideation in elderly man (OR=2.22, 95% CI=1.07, 4.64), while divorced/separated/widowed/single status was associated with increased the risk of suicidal ideation newly (OR=3.35, 95% CI=1.00, 11.2). For elderly women, association between low social network for family and friends and suicidal ideation disappeared after controlling for socio-demographic, social integration and perception variables. However, for both genders, experiencing stress and depression were associated with elevating the risk of suicidal ideation newly.

Chapter 4. Discussion

The purpose of this study was to investigate the effect of social integration on suicidal ideation in eldery people. Overall, there is modest evidence that social integration was associated with suicide ideation. The effects were attenuated by controlling for socio-demographics and perception variables.

For the social participation, three types of social participation were identified - religious involvement, frendship network and

leisure activities. In this study, only freindship network was significantly associated with a lower risk of suicidal ideation in men. For the social network, social network for neighbors and family had a positive association with suicidal ideation in women.

Social participation not only influences the positive rewards or feelings built up by the individual, but also creates a sense of strength in the individual and leads to feel the emotional support that people wish(H. Lee, Jang, Lee, Cho, & Park, 2008; Phillips, 1967). Thus, the psychophysiological outcome of positive social participation might help to decrease the risk of suicidal ideation and behavior (Berkman, Glass, Brissette, & Seeman, 2000; M. Lee, 2012; Vilhjalmsson, Kristjansdottir, & Sveinbjarnardottir, 1998).

Among the type of social participation, the multivariate analysis showed that only lack of freindship network increased the suicidal ideation of elderly men. Several studies have suggested that there is gender distinction in affiliative noms and behavior. Friednships of women are face to face, while those of men are regarded as side by side (Wright, 1982). Friendships of women also are more intimate, while men's are reported to focus on shared activities(Felmlee & Muraco, 2009). Women had a tendency to view many infractions of freindship rules as more inadquate than did men. Women were more displeased than men of friends who betrayed trust. Women also evaluated a friend who failed to come to their defense when another person criticized them more negatively.

One explanation for the differences between men and women in friendship focuses on the cultural formation of gender. Friendship tends to be an important social relational stage for the establishment of cultural messages and beliefs considering gender(Ridgeway & Correll, 2004). Current gender stereotypes connote messages that frame women as more collaborative in their human relations and men as more instrumental and more agentic (Eagly & Amanda, 2000). The effect of cultural stereotyping and gender socialization maintains throughout the life course. Therefore, friendship norms for elderly men and women are different since distinct values and behaviors are

stressed socially and reinforced culturally.

Another explantion for gender differences in affiliative behavior and normative expectations centers on societal gender inequality and the social structure itself (Risman, 2004). Men constantly have more power in society and occupy eminent and highly paid job positions. Women also have more caregiving responsibilities than men (Felmlee & Muraco, 2009). These ramifications of gender inequaltiy continue to old age. The poverty rate for older women is more than twice that of older men since women are lilkey to live longer and they tend to have less pensions plans (Miller 1998). Elderly women have higher rates of psychological distress than elderly men. Distress is largely because of financial matters that are in turn in part associated with women's higher tendency to be nonmarried (Keith, 1993). Furthermore, women report lower levels of contentment with retirement, largely due to their lower incomes and somewhat because of their decreased propensity to be married (Seccombe & Lee, 1986). These disparities in economic condition between men and women explain why men are more likely to be albe to pay attention to freindship network than in women. Relatively, Women could only invest scarcer resources in maintaining freindship than men.

Large social networks are valuable since they provide a large pool of resources. Yet the particular composition and structure of elderly people's neworks is also important. Older adults consider that emotional satisfaction in social relationships is important (Fredrickson & Carstensen, 1990). Thus, older people may prefer networks that consits of kin and strong ties. These networks are beneficial to develop shared social norms and confidence, and offer access to unconditional social support(Hurlbert, Haines, & Beggs, 2000). Those who have scarcer networks tend to be less accesscible to social support, emotional help and companionship (Haines & Hurlbert, 1992). If older people act upon the preferences for more emotionally strong ties, it could result in imbalanced loss or giving up weak ties.(Klein Ikkink & van Tilburg, 1999; Shaw, Krause, Liang, &

Bennett, 2007) This increased selectivity is known to be more prominent among men.(Shaw et al., 2007) This change is able to reflect transitions in perceptions of masculinity that often happen in later life, which force men to accept more nurturing roles and to stem influence from the chances to deliver wisdom and experience(Mann, 2007) This psychological shift conduces to men's reducing bridging merit relative to women in later life. Thus, elderly women might be more affected by the type of social network than elderly men.

The elderly felt the highest satisfaction of emotional experiences in family relationship (Charles & Piazza, 2007). The family network appears to be densed with strong linkages between members and great helpfulness. Intimacy emerged as a significant factor in the family interaction. Bonds of intimacy permit for the exchange of love, confidence and trust. Particularly, in Korea, parent care is influenced by the value of filial piety(K.-T. Sung, 1990). Koreans are trying to realize the ideal by offering care and services to their parents in the family network. Parents also dedicate themsevles to children. Therefore, the system of filial piety is similar to a mutual exchange. It shows that respect for the eldery is the key factor which can retain the status of older adults in the modern society of Korea. This is linked with the finding that as the frequecy of contact with family deacreased, the risk of suicidal ideation of elderly women increased.

Nevertheless, social support from family for older adults has sharply diminished, especially in urban areas(K. Sung, 1991). Therefore, it can be easily explained that the importance of other social support has been overly emphasized (K. Sung, 1991). One of the social support that focus on now is neighborhood.

Residential neighborhood environment may be accentunated among elderly people due to mobility, mental decline related to age, reduction in social support and social network and elevated fragility (Johnson & Troll, 1994; Shaw et al., 2007). Mobility is defined as physical capacity to move around and also driving skills which affect

number and location of activities (Marottoli et al., 2000). Declines in functioning lead to reduce mobility and the capacity to socialize so that the freqeuncy of contact with social networks reduces with age(Tilburg, 1998). Fewer contingences with social network members could result in a greater relience on the immediate residential neighborhood(I. H. Yen, Scherzer, Cubbin, Gonzalez, & Winkleby, 2007).

Thus, it was not surprising that as the frequecy of contact with negihbors deacreased, the risk of suicidal ideation of elderly women increased. Yet the previous researches are not consitent with this finding. Future research should concentrate on the features of neighborhoods that offer the most support and the most threat to elderly people.

Both elderly men and women who experienced depression had higher rate of suicidal ideation. Depression has been reported to be the main contributor to risk for suicidal ideation(Schaffer et al., 2000). However, it is difficult to prove the distinct pathway between elderly people and suicidal ideation since the causes of depression, including chronic disease and presence of disability, are complicated and varied. Severe perceived stress was also significantly associated with suicidal ideation in both gender. This indicates unfavorable psycosocial status and is accordance with previous studies(Almeida et al., 2012).

Perceptions of life as a burden and lacking autonomy and personal control are able to induce severe psychological distress that may result in suicidal ideation (Van Orden and Conwell 2011).

Besides, we can not ignore the ecological perspective on suicide which evaluates how area composition, characteristics and resources form social interactions and helath outcomes (Jeffrey D. Morenoff, 2003). Suicide distribution seems to be uneven geographically. This phenomenon has continued over time, both between and within countries(Saunderson & Langford, 1996) suggesting a careful consideration of areal-level influence factor of suicide. Seoul is composed of 25 community districts. Among them,

Kangnam and Seocho show markedly high total local tax collected comparing to other community districts. (Statistics Korea, 2009) It appears that Kangnam and Seocho promote investment and production for the region actively. These area socio-economic characteristics have concluded that there could be true differences in relation to region and population where the studies carried out. Thus, compositional effects of 8 community districts and the contextual effects of social realtions within those areas might be different from those of Kangnam and Seocho.

4-1 Limitations

There were a number of limitations to this study. Firstly, because of the cross-sectional nature of the study, evaluation of casuality in the relationship between suicidal ideation and social participation and social network was not clearly distinguishable.

Secondly, the study sample was limited to the population of eight communites in Seoul. Communites in Seoul do not represent other Korean community regions. Thus, results of this study should be applied cautiously.

Third, although this present study considered various factors, there is still a possibility that some omitted variables are able to influence the associations that were found. Review of more complete multivariate models is necessary for increasing understanding of these various potential interactions.

Fourth, although two indicators of social integration were used in this study, it does not imply that this study measured them completely.

Chapter. 5 Conclusion

In spite of these limitations, there is a number of strengths in this study. First, the result of this study serves to provide gender-specific social support. In addition, this study is one of the few to bridge the social integration and suicide ideation by investigating type of social participation and social network and its association with suicide thoughts aross gender. The study emphasizes the potential of examining social participation, social network and its relationship with suicidal ideation in future studies. Lastly, this study presents the empirical evidence of the components of social participation and social networks in the unique Korean context.

The rapid increase in the rate of suicide in recent years has motivated the governments to implement preventive strategies. Since policymakers are considering evidence-based strategies to decrease suicide, comprehending how the findings from this study could inform the understanding of mechanisms through which social integration influences suicdal ideation in odler adults is helpful for them.

The findings from this study provide some insight that decrease in the prevalence of mood disorders in elderly people should be a major target of the national strategy for suicide prevention. It can be operationalized through public education campaings about the symptoms, treatment, prognosis for depression in senescence, and selected and indicated inerventions such as regular medical checkups by community health centers for early detection of depression in elderly people at high risk.

Additionally, longitudinal researches are required in an attempt to not only more accurately represent the experiences of individuals but also solve the causal connections in the formation or maintenance of suicidal ideation .

The cause of suicide in later life should be comprehended as a complicated combination of interactive effects. Ability to more correctly target preventive interventions will depend on a better understanding of those relationships. Therefore, to meet the needs of the elderly, larger studies with more participants characterized with standardized methodologies, enabling evaluation of complex interactions between risk factors were required.

Government should act in order to cultivate contexts favorable to social integration of the elderly by facilitating community interaction and evaluating its efficency.

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국문 초록

서울시 서남부 지역 노인들의 사회참여와 자살 생각

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연구배경 및 목적: 노인 자살은 지난 20년 동안 급격하게 증가하며 중요한 보건학적 문제로 부각되고 있다. 그러므로 노인 자살의 위험요인과 보호요인을 이해하는 것이 급선무이며, 사회참여활동이 자살 생각에 미치는 영향에 대한 관심이 커지고 있다. 본 연구에서는 성별에 따라 한국 사회의 사회참여활동과 사회적 연결망의 종류가 노인 자살 생각에 대해 미치는 영향을 검증하였다.

연구 방법: 본 연구는 2013년 지역사회건강조사 자료를 사용하였다. 서울특별시 8개 구에 거주하고 있는 65세 이상의 노인 1,211명을 대상으로 성별에 따라 두 집단으로 구분하였다. 사회참여활동, 사회적 연결망, 주관적 건강 상태와 정신 건강에 관련된 문항들을 이용하여 노인의 자살 생각을 분석하였으며 세 종류의 사회참여활동과(종교활동, 친목활동, 여가활동) 세 요소의 사회적 연결망(가족, 친구, 이웃)의 효과를 검증하였다. 또한 사회참여활동과 노인 자살 생각 간의 연관성 파악 및 혼란변수의 보정을 위해 다변량 로지스틱 회귀분석을 시행하였다. 모든 분석절차는 SAS 통계 프로그램 9.3버전으로 진행되었다.

연구결과: 사회인구학적 변수, 지각 변수들을 보정 시 남성 노인에서는 친목활동에 참여하지 않으면 자살생각이 유의하게 증가하였다 (OR=2.22, 95% CI=1.07, 4.64). 여성 노인은 사회인구학적 변수를 보정 시 낮은 가족과 이웃 연결망을 가질 때

자살 생각이 높게 나타났다. 스트레스와 우울은 남성 노인과 여성 노인 모두에서 자살 생각의 유의미한 주요 변수로 나타난 반면 결혼 유무는 오직 남성에서만 자살 생각의 유의미한 주요 변수로 나타났다.

결론: 사회참여활동과 사회적 연결망이 자살 생각에 약한 영향을 미친다고 나타났다. 이러한 연구 결과는 향후 성별로 세분화 된 자살을 예방할 수 있는 프로그램을 개발하는 데 유용한 정보를 제공하고 관련 연구에 다양한 시사점을 제공하는데 의미가 있다.

주요어: 사회참여 활동, 사회적 연결망, 노인 자살 생각

학번: 2012-23731