


Social Relationships and Suicidal Ideation Among the Elderly Who Live Alone in Republic of Korea: A Logistic Model

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Abstract

With population aging and change in family structure, the number of the elderly who live alone is rapidly increasing in Korea. The aim of this study was to explore the association between social relationships—especially newly formed formal social relationships (FSRs)—and suicidal ideation among Korean elderly who live alone. The elderly who live alone (N = 2509) from the 2014 Survey of Living Conditions and Welfare Needs of Older Koreans were analyzed using logistic regression. This study found that informal social relationships (ISRs) (eg, children, friends and neighbors) of the elderly who live alone had statistically significant association with suicidal ideation, whereas FSRs (eg, formal helper and social participation) did not have significant association with suicidal ideation. The findings of this study suggest that the Korean Government needs to strengthen public system for alleviating social isolation of the elderly living alone. Therefore, this study proposed 2 strategic approaches to maintain and strengthen ISRs and to develop different types of FSRs (eg, the measures to combine FSRs with ISRs, gatekeepers, etc).

Keywords

suicidal ideation, formal social relationships, informal social relationships, elderly who live alone, Republic of Korea, logistic models

What do we already know about this topic?

There are some studies about the associations between formal social relationships and informal social relationships and suicidal ideation in the elderly living alone in South Korea, but influence of formal helpers among the formal social relationships on suicidal ideation has not yet been studied.

How does your research contribute to the field?

Because the Korean government has promoted formal social relationships through suicide-related programs, this study adds new operational definitions of formal social relationships such as the formal helper and analyses the associations between formal relationships and suicidal ideation in the elderly living alone.

What are your research's implications toward theory, practice, or policy?

This study proposed 2 strategic approaches to maintain and strengthen informal social relationships and to develop different types of formal social relationships (eg, the measures to combine formal social relationships with informal social relationships, gatekeepers, etc).

Introduction

One of the noticeable population changes in South Korea is the increase in both the elderly and the elderly who live alone.¹ The number of elderly who live alone nearly tripled from 540 000 in 2000 to 1.44 million in 2014. The proportion of the elderly who live alone among older persons is 22.8%, which means that approximately 1 in every 5 older persons lives alone.¹

There are significant concerns about the elderly who live alone as a social problem because they are exposed to various risk factors. They are more likely to be isolated from

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their families and their society because they do not have housemates. Living alone in old age when people become so infirm that it is difficult for them to live independently also brings serious problems. The elderly who live alone have higher risks of depression and suicide.^{2,3} Most of the elderly who live alone sever their family and social relationships gradually. They live solitary lives. They might ultimately end their lives by committing suicide or otherwise dying alone.ⁱⁱ

More seriously, Korea ranks first among Organisation of Economic Co-operation and Development countries in the rate of suicide among the elderly. According to Korea National Statistical Office,⁴ an average of 58.6 Korean elderly people per 100 000 committed suicide, which was twice more than the average of Korean population and 3 times more than the OECD average.

The Korean government has implemented direct and indirect suicide-related program for the elderly who live alone to prevent the solitary deaths and lower the high suicide rate. First, as a national strategy for suicide prevention, the South Korean government established the First Suicide-Prevention Plan (2004-2009) in 2004 due to a high suicide rate. Thereafter, the Act for the Prevention of Suicide and the Creation of Culture of Respect for Life was enacted in 2011, which states that the government should take measures against suicide tailored to different life stages including elderly. Now the third plan is being implemented. Second, there are diverse programs to provide care services for older adults living alone. The programs were designed to protect older adults living alone from social isolation and to provide them with support services. The aim is to prevent social isolation and confirm safety through service connection among the elderly living alone. For example, there are Basic Care Services for Older Adults Living Alone,ⁱⁱⁱ Program to Make Elderly Who Live Alone Friends, Emergency Call Program for Elderly Who Live Alone, and Long-Term Care Insurance (LTCI).^{iv} The elderly who live alone in Korea have access to many services, such as nutrition, disease prevention, and mental health promotion.

Recently, with diminishing of informal social relationships (ISRs) based on traditional friendship, Korean citizens expect that the government will be responsible for the elderly rather than the elderly's families, by paying taxes to the government, accordingly, formal social relationships (FSRs) have become more vigorous. Traditional Confucian values have also become weaker among young people because of the rapid changes in Korean society. One recent study reflected the change in attitudes toward supporting the elderly: The proportion of respondents who thought the responsibility for supporting one's parents lay with the family decreased from 89.9% in 1998 to 31.7% in 2014. Moreover, the proportion of respondents who asserted that the government was responsible for supporting their parents increased from 1.9% to 51.7% during the same period.⁵

On the contrary, Korea has unique cultural and institutional features that distinguish it from Western countries.

Because the family values that derive from Confucianism still have tremendous effects on the Korean people, Korea recognizes the problems of the elderly as ethical issues rather than social policy issues.^{5,6}

Despite these conflicting views, there is no general agreement about the suicide issue for the elderly in Korea, and there have been only a few studies on the associations between FSR^v and suicide among the elderly. In East Asian suicide study, scholars have focused on China, Taiwan, and Japan⁷⁻¹² rather than on Korea.¹³⁻¹⁵ Thus, we know little for international literature on the associations between formal relationships and suicidal ideation among the elderly who live alone in Korea. This study will provide empirical evidence about suicidal ideation among aging population in Korea and will fill the gap in the international literature by presenting results from an Asian country.

In fact, suicide has received high academic attention. Most research has been devoted to theories on suicide^{16,17} and empirical studies.^{2,10,13,15,18-28} Researchers have vigorously studied the sociodemographic factors that affect suicide among the elderly in addition to the effects of their relationships.^{18,22,23,28-34} Unfortunately, FSRs have been studied far less than ISRs in Korea,^{14,15,35} even though the government has promoted FSRs. In this context, the objective of this study was to analyze effects of both formal and informal relationships on suicidal ideation among the elderly who live alone in Korea.

Literature Review

Factors That Affect Suicide and Suicidal Ideation

Researchers have conducted a wide variety of empirical studies on suicide among the elderly in terms of the sociodemographic factors that affect suicide, and their overall findings are as follows.

First, suicide in the elderly depends on personality characteristics; people who commit suicide are more likely to be male, older, divorced, and less educated, and to have low incomes.^{2,12,15,20,21,25,28,30,36}

Second, suicide in the elderly is associated with health; specifically, subjective health status is negatively related to suicide. Depression is a significant factor in suicidal ideation and behavior.^{7,13,21,25,28,37}

Most studies have addressed the associations between health and suicide, and some scholars have focused on relationships. However, Duberstein et al²⁰ emphasized that there must be other contributors to suicide, because all elderly people do not have mental disabilities and depressive symptoms. Rather, individuals internalize social norms and values, which become part of their personal characteristics. Researchers have also shown that social integration is significant in explaining suicide²⁰ and similarly, the relationships have been associated with suicidal ideation.^{2,3,12-15,18,22,23,25,28,32,33,35,37}

Social Relationships and Suicide Among the Elderly

The elderly population's relationships are significant factors in explaining suicide, as we observed earlier. According to Vanderhorst and McLaren,²⁸ relationships with family and friends as supporters can reduce suicidal ideation.

Sociologists classify relationships as formal or informal. FSRs are associative behaviors, such as participating in formally established organizations and activities.³⁸ FSRs can be defined as (1) having a relationship with formal organizations or (2) participating in social activities. The best known of these has centered on the study by Durkheim,¹⁶ who argued that poor social integration increased the risk of suicide. According to suicide theory, suicide is more likely to happen when a person is less involved in social groups.^{17,20} For instance, suicide is caused by loss, isolation, lack of social contact, and lack of community participation. Based on the theory, because the power of integration and regulation depends on relationships, different types of relationships affect individuals' thoughts and behaviors differently.³⁵

In this context, some social ties strongly regulate thoughts and behaviors, but some social relationships have relatively weak regulatory power. Given the variety of relationships, it is plausible that formal and informal relationships may have different effects on suicide and suicidal ideation. The previous studies demonstrate that the elderly have strong relationships with children, friends, and neighbors are less likely to have suicidal ideation. The FSRs are newly established, whereas the ISRs are under social pressure. This study assumed that the elderly's formal and informal relationships would internalize norms and values differently into the elderly's thoughts and behaviors.

Method

Data and Statistical Analysis

This study used the 2014 Survey of Living Conditions and Welfare Needs of Older Koreans, conducted by the Korean Institute for Health and Social Affairs and the Ministry of Health and Welfare (KIHASA). The data are from a nationally representative sample of adults aged 65 years and older, excluding those in residential facilities and in island areas, and were collected in 2014. The sample design was as follows. The sample was first stratified for city and province (16 cities and provinces), and then the 9 provinces, excluding 7 metropolitan cities, were stratified into urban and rural areas. These data included respondents' general characteristics, family and other relationships, financial, health, physical status, quality of life, social participation, care service, and other variables.

This study extracted samples from the survey; our sample size was 10 451. The target group for this study was elderly persons who lived alone and were above age 65 years. Data of 2509 cases were ultimately analyzed.

This study used descriptive analyses and logistic regression for our analyses. Descriptive analyses were run to characterize the present study sample. These analyses contained weighted frequencies, proportions, mean, standard deviation, and binary logistic regression analysis to calculate odds ratio (95% confidence interval) and *P* values. This study used Stata 14 package program for our analyses.

Measure

Suicidal ideation. The dependent variable in this study was suicidal ideation. The questionnaire measured suicidal ideation by asking "Have you thought about committing suicide since age 60?" The self-report responses were measured using binary variables composed of Yes (1) and No (0), which showed whether the elderly person living alone had thought about suicide after age 60 years.

Social relationships. This study classified the elderly's relationships, which were the main independent variables in this study, as formal or informal. First, according to the conceptual definition of Pichler and Wallace,³⁸ the present study defined FSRs in 2 ways: Whether elderly living alone made connections with society by (1) establishing official relationships with formal organizations or (2) participating in social activities. The former are the relationships the government created to prevent social isolation among the elderly who live alone in modern society when their ISRs have been weakened. This study assessed the respondents' relationships using questions about whether the government had provided services for them according to their formal helpers. The term "formal helper" is defined based on the term of "informal helper"^{39,40} of antonym. Formal helper is commonly used to describe existing ones in many public programs for the elderly including LTCI caregivers, social workers, caregivers, care managers, daily living managers, staffs at emergency call centers, counselors, and older volunteers who deliver meals and assistance and serve as visitors to older adults. The 2014 Survey of Living Conditions and Welfare Needs of Older Koreans include key questions for this study: "Have you been receiving help with activities of daily living from persons outside your family?" and "Who has been helping you?" The answer choices were yes or no for the first question, and paid caregivers, LTCI caregivers, or care vouchers for the elderly for the second question. Paid caregivers can be hired on the market, and LTCI caregivers are dispatched by LTCI, which is a universal institution in Korea. Care vouchers for the elderly include all the services provided selectively to the low-income elderly and those who live alone, such as sending companions to talk with people or to assist with the activities of daily living.

The second aspect of the definition of FSRs refers to participating in diverse social activities as members of civil society, as highlighted by Putnam,³⁸ or using programs provided by formal organizations. In other words, FSRs are ties

with societies that are formed by means of social participation. They include learning activities; club activities; volunteer work; charity drives; membership in fraternal,^{vi} political, and/or religious organizations; and using community centers for the elderly.

Second, ISRs are bonds based on friendship. ISRs are defined as relationships based on affinities with family members, friends, and neighbors, not based on formal organizations or activities.^{38,41} This study measured ISRs by using affective tie and friendships based on affinities, by the frequency of meeting children, siblings and other relatives, and friends and neighbors in person. The questionnaire included the following questions to measure the frequency: “How often did you meet people who lived separately from you during the last year?” Respondents were asked to choose the extent to which they met people, by using the following ordinal variable responses: (1) almost every day, (2) twice or 3 times a week, (3) once a week, (4) once or twice a month, (5) once or twice in 3 months, (6) once or twice a year, and (7) have little contact. This study reverse-coded the answers to these statements, so that “have little contact” was marked as 0 and “almost every day” was 6 points.

Sociodemographic variables. This study entered the sociodemographic characteristics—age, gender, education attainment, annual household income, self-reported health status, and depression—as control variables. Age, income, and education were continuous variables; gender was a dummy variable; and self-reported health status was a 5-point scale. The health status question asked, “How do you feel about your overall health?” and the respondents answered on a scale of 1 (excellent) to 5 (poor). This study measured depression with the yes (1) or no (0) question: “Have you ever been diagnosed with depression?”

Results

Descriptive Statistics

Table 1 shows the sociodemographic characteristics of the study sample. The average age of the elderly who lived alone in this sample was 75.82 years, with a range of 65 to 102 years. There were 454 males (18.10%) and 2054 females (81.90%), and these figures confirm the well-known fact that the proportion of females is very high among the elderly who live alone in Korea. For self-rated health status, for which higher values indicated better health, the participants' average health was 2.65 point; 52% reported their health as poor, and 48% said their health was good. This study measured education attainment using years of education; the elderly who lived alone had received 4.63 years of education on average. After-tax annual household income averaged KRW 9.1 million. For depression, 4.24% (106) of the respondents had a current diagnosis of depression.

Table 1. Sociodemographic Characteristics of the Elderly Who Live Alone (n = 2509).

Variables	n (%) or mean (SD)
Sociodemographics	
Age in 2014	
Mean (minimum 65-maximum 102)	75.82 (6.59)
Gender	
Male	454 (18.10)
Female	2054 (81.90)
Self-reported health status	
Mean (minimum 1-maximum 5)	2.65 (0.95)
Poor	201 (8.05)
Fair	1102 (44.22)
Good	583 (23.40)
Very good	585 (23.48)
Excellent	21 (0.84)
Education attainment	
Mean (minimum 0-maximum 23)	4.63 (4.54)
1 (minimum 1-maximum 6)	1996 (79.55)
2 (minimum 7-maximum 12)	432 (17.22)
3 (minimum 13-maximum 15)	29 (1.16)
4 (minimum 16-maximum 18)	48 (1.91)
5 (minimum 19-maximum 23)	4 (0.16)
Income	
Mean (minimum 0-maximum 158.5 M)	9.1 M (843.41)
Location	
urban	925 (36.87)
rural	1584 (63.13)
Employment status	
Employed	641 (25.55)
Unemployed	1868 (74.45)
Depression	
Yes	106 (4.24)
No	2403 (95.76)

Note. M= Korean Won(KRW) million.

Table 2 presents the descriptive statistics about the main study variables. Approximately 15% (380) of the elderly who lived alone had thought about committing suicide after age 60 years; the remainder had not. In addition, this study measured FSRs based on 2 factors: relationships with formal helpers who were sent by the government and participating in social activities. Approximately 1 in 20 (143) respondents reported having relationships with their formal helpers; these helpers support elderly persons who live alone with emotional support, cleaning, nursing, and other needs. For participating in diverse social activities, 89% of the elderly who lived alone (2229) had these experiences.

Third, this study evaluated ISRs, which are based on affinities with children and other relatives, using frequency of meeting in person. The elderly who lived alone met with their children who did not live with them once or twice a month, their siblings and other relatives once or twice a year, and their friends and neighbors twice or 3 times a week.

Table 2. Descriptive Statistics of the Study Variables (n = 2509).

Variables	n (%) or mean (SD)
Dependent variable	
Suicidal ideation	
Yes	380 (15.25)
No	2112 (84.75)
Independent variables	
FSRs	
Formal helper	
Present	143 (5.72)
1. Paid caregivers	4 (0.19)
2. Formal caregiver in LTCI	70 (2.83)
3. Care vouchers for the elderly, etc	69 (2.76)
None	2365 (94.28)
Social membership/participation	
Yes	
Learning activities	403 (16.07)
Senior club activities	54 (2.18)
Political membership	6 (0.25)
Donation participation	70 (2.82)
Volunteering—person	207 (8.29)
Volunteering—time and effort	62 (2.50)
Senior center membership	1047 (41.76)
Fraternity group membership	784 (31.25)
Travel activities	625 (25.20)
Religious practice	1719 (68.53)
No	
279	(11.12)
ISRs^a	
Children	
Mean (minimum 0-maximum 6)	3.16 (1.60)
Siblings and other relatives	
Mean (minimum 0-maximum 6)	1.23 (1.35)
Friends and neighbors	
Mean (minimum 0-maximum 6)	5.03 (1.60)

Note. Sampling weights were applied to all variables. FSR = formal social relationship; LTCI = Long-Term Care Insurance; ISR = informal social relationship.

^aScore.

Logistic Regression Analyses of Suicidal Ideation Among the Elderly Who Lived Alone

Table 3 shows the results from logistic regression analyses that tested the associations between formal and informal relationships and suicidal ideation among the elderly who lived alone, after controlling for other variables. This study built 3 separate models as follows: Model 1 included FSRs and demographic variables, Model 2 included ISRs and demographic variables, and Model 3 included all variables.^{vii}

The results for Model 1 indicated significant effects of FSRs (social group membership or community participation) on suicidal ideation (Wald test = 3.67, $P = .057$, odds ratio [OR]: 0.72, 95% confidence interval [CI]: 0.51-1.01). As expected, the older adults who experienced in social

activities were less likely to report suicidal ideation. In other words, suicidal ideation is less common when the older adults have social networks or engage in community activities, such as attending senior centers, volunteering, joining political groups, making donations, religious activities, senior club activities, and community groups. One particular FSR with the formal helper, however, had no significant association with suicidal ideation; that is, social ties with service providers sent by the government have little effect on preventing suicide among the elderly who live alone.

Model 2 showed that suicidal ideation was less common in elderly respondents who had contact with children who did not live them (Wald = 8.78, $P = .005$, OR: 0.88, 95% CI: 0.81-0.96) or with friends and neighbors (Wald = 11.20, $P = .001$, OR: 0.88, 95% CI: 0.81-0.95). The result that family relationships decreased suicidal ideation matched the existing research findings. Effects of nonkinship relationships with friends and neighbors on suicidal ideation can be found in Western research,²⁸ although these differ from findings for Korea.³⁵

In Model 3, this study tested associations between relationships (measured by formal helper, social participation or organizational involvement, children, relatives, and friends and neighbors) and suicidal ideation, while controlling for sociodemographic variables. As expected, children (Wald = 8.47, $P = .006$, OR: 0.89, 95% CI: 0.81-0.97) and friends and neighbors (Wald = 8.75, $P = .001$, OR: 0.88, 95% CI: 0.82-0.96) were significantly related to suicidal ideation; specifically, being in touch with these people more frequently reduced suicidal ideation in the elderly who lived alone. However, the effects of FSRs and of ISRs with siblings and other relatives were not significant. In summary, ISRs—bonds with children, friends and neighbors—have stronger effects on suicidal ideation than do FSRs established by the government of Korea.

Last, participants who were older, male, and depressed and who self-reported their health status as poor were more likely to have suicidal ideation among the elderly who lived alone; these findings matched the existing research findings. For residential location (urban or rural), the elderly who lived alone in rural areas were less likely to have suicidal ideation than were those who lived in urban areas. In South Korea, a few previous studies explored the relationship between residential location and suicide or suicidal ideation, and most of them found the relationship to be insignificant.^{29,31} Education, income, and employment status were not significant.

Discussion

Policy and Practical Implications

This study attempted to analyze the associations between formal and informal relationships and suicidal ideation. Our results provide several implications for social work practice and social policy for the elderly.

Table 3. Predictors of Suicidal Ideation Among the Elderly Who Live Alone.

Variables	Suicidal ideation								
	Model 1			Model 2			Model 3		
	Wald	OR (95% CI)	P value	Wald	OR (95% CI)	P value	Wald	OR (95% CI)	P value
FSRs									
Formal helper ^a	0.81	1.25 (0.75-2.08)	.379				0.78	1.27 (0.74-2.20)	.388
Social membership/participation ^a	3.67	0.72 (0.51-1.01) [†]	.057				0.94	0.83 (0.57-1.21)	.336
ISRs									
Children				8.78	0.88 (0.81-0.96)**	.005	8.47	0.89 (0.81-0.97)**	.006
Siblings/relatives				1.57	0.93 (0.83-1.05)	.254	1.56	0.94 (0.83-1.05)	.257
Friends/neighbors				11.20	0.88 (0.81-0.95)***	.001	8.75	0.88 (0.82-0.96)**	.001
Sociodemographics									
Age	15.22	0.96 (0.94-0.98)***	.000	10.26	0.97 (0.94-0.98)**	.002	10.70	0.96 (0.94-0.99)***	.000
Gender ^a	15.26	1.86 (1.36-2.54)***	.000	13.41	1.86 (1.35-2.57)***	.000	12.21	1.83 (1.32-2.53)***	.000
Health	54.65	0.58 (0.50-0.67)***	.000	54.14	0.57 (0.48-0.67)***	.000	51.40	0.57 (0.49-0.68)***	.000
Education	0.24	0.99 (0.96-1.03)	.639	0.95	0.98 (0.95-1.02)	.341	0.84	0.99 (0.95-1.02)	.370
Income	0.15	0.99 (0.99-1.00)	.772	0.03	0.99 (0.99-1.00)	.894	0.03	0.99 (0.99-1.00)	.896
Location ^a	8.65	1.50 (1.14-1.96)**	.003	6.55	1.44 (1.09-1.93)*	.011	6.46	1.45 (1.09-1.92)*	.011
Employment ^a	0.07	1.04 (0.78-1.39)	.794	0.10	1.05 (0.77-1.43)	.749	0.19	1.07 (0.79-1.46)	.666
Depression	30.53	3.24 (2.12-4.91)***	.000	25.16	3.21 (2.03-5.10)***	.000	25.18	3.21 (2.02-5.10)***	.000
Constant	—	11.99 (2.13-67.53)**	.005	—	19.47 (3.10-122.47)**	.002	—	22.60 (3.59-142.37)***	.000

Note. OR = odds ratio; CI = confidence interval; FSR = formal social relationship; ISR = informal social relationship.

^aThe reference group was no formal helper, no social membership, female, rural, and unemployed. All were coded as 0.

[†]p < .10. *p < .05. **p < .01. ***p < .001.

First, the descriptive statistics of this study showed that the suicidal ideation rate of the elderly living alone is approximately 15%, which is very serious. Extending the sample of this study to the total older population who live alone of 1.4 million, we can estimate that about 216 000 elderly who live alone have suicidal ideation in Korea. The number of suicidal ideation is related to the fact that Korea has ranked at the top for suicide rates among the elderly in recent years.⁴² Korean policymakers should not try to solve the elderly's problems by relying on the cultural tradition of filial piety. Politicians should not impute more of the responsibilities to families and should realize that all the problems among the elderly who live alone are social policy issues.

Second, this study demonstrated that ISRs with children had stronger associated with suicide risk and ISRs with friends and neighbors were less likely to have suicidal ideation. In contrast, FSRs established by the Korean government did not have significant association with suicidal ideation except for those concerning social membership or participation in Model 1. This is consistent with the findings from a previous study¹² and shows that participation in social activities was related to suicidal ideation. The possible explanations why FSRs were not statistically associated with suicide ideation are 2-fold. First, differences between FSR and ISR might reflect the duration of relationships because FSR would have been shorter than ISR. Second, the Third Suicide-Prevention Plan (2016-2020) has been implemented after the Second Suicide-Prevention Plan (2009-2013). However, there was the huge gap which might have led to the no significant association with outcomes of the second plan. Pichler and Wallace³⁸ have described that, when "Substitution of FSRs by ISRs" occurs, formal civil participation is weakened but informal support network and networking become stronger (eg, south and east Europe). Results of this study indicate that FSRs and ISRs are complementary, not substitutive, suggesting that 2 strategic approaches are required. The first solution is to maintain and strengthen the ISRs (eg, family, friends and neighbors) throughout their old age. The second is to develop diverse FSRs and support community social activities. For instance, the Korean government can consider (1) introducing a system that ensures the right of user's choice regarding a formal caregiver or cash payments for care, as in the case of Western countries (eg, Germany), (2) giving a living elderly the discretion of mix in selecting formal caregiver (eg, methods to combine FSRs with ISRs), and (3) developing new networks. Korean government should go beyond the dichotomy of formal versus informal and consider allowing people with social ties to be formal helpers. This study also discussed implications for practice against elderly suicide. Formal helper should be educated about ethical duties that they must report to appropriate agencies and provide crisis intervention services when they discover that their clients have suicidal ideation.

Third, this study showed that ISRs with siblings and other relatives were not significant in explaining suicidal ideation,

although relationships with children, friends, and neighbors were. This finding differed from the existing research in Korea. However, this study used relatively new data and focused on the fact that older Korean people would receive emotional support from friends and neighbors when their kinship (eg, relative) ties were weakened. Finding of this study is consistent with findings from previous studies conducted in a Western country.^{18,22,23} Like the previous research in Japan,⁴³ this study also found that family and friend relationships were significant and that there were no differences between the influences of family and friends. Friends and neighbors give emotional support, help with hard problem solving, and conduct as advocates. Neighbors who often perform good gatekeeper's role can fulfill natural helping functions and may strengthen these networking through organized programs.⁴⁰ This study suggests that it is important to intervene at the community-based supports to prevent suicide. It is necessary to discover informal resources that are easily available to the elderly who live alone and practically helpful. The program to prevent charcoal burning suicide is a good example, which uses storekeepers as the informal resources. The storekeepers receive suicide-prevention education and have to find out the reasons customers—especially, older people who live alone—want to buy cannel coal. The storekeepers are gatekeepers in suicide prevention. One of the advantages of using gatekeepers is that they know about their community, which assists in the early identification of a potential suicide.

Fourth, social workers for the elderly can take note of the factors that increase suicide risk. The role of social workers to prevent suicide for the elderly living alone is as follows. First, Social workers can intervene to mental health services about high suicide risk group. Second, he or she can build social support systems and intervene practically at the community level. For example, social workers can develop gatekeepers and diverse suicide-related education programs for the citizen. Third, our results report that respondents who had depression and less support from their families were more likely to have suicidal ideation. These factors can be used to choose target group participants in suicide-related programs. Last, it is necessary to establish suicide prevention councils in community. The mental health centers and local medical hospitals that have information about high suicide risk group—especially, older people who live alone are socially isolated and have mental health problems—should be included in the councils.

Last, we need to highlight the result that income had no significant effects on suicide, as is consistent with the findings from a previous study.³⁶ Policies for the elderly have been based on income, but the results of this study indicate that suicide risk is independent of income level among the elderly who live alone. This implies that some socially isolated elderly with high incomes may be at serious risk.^{viii} Because the association between income and suicide was insignificant in this study, high-income earners cannot be

considered safe from suicide or dying alone. Social workers who work in elderly care or suicide-related settings, which now consider income when choosing targets, should reflect on the meaning of this result.

This study showed that older Korean people still rely heavily on ISRs even though the Korean government has put forth a variety of policies and programs to prevent suicide among the elderly. This appears to be attributable to gaps in the pace of change between social policy and traditional culture. Because cultural cognition changes more slowly than policy issues do, Korea is still in the process of adjusting functions between FSRs and ISRs.

Strengths and Limitations

The Korean government has promoted FSRs through suicide-related programs and care services for the Korean elderly. This study tried to use new operational definitions of FSRs and attempted to analyze the associations between formal and informal relationships and suicidal ideation.

However, our study has limitations. First, there are measurement limitation problems in how secondary data were approached. This study treated FSRs as binary variables (yes or no as possible response to related questions), contrary to ISRs that were measured as continuous variables. Second, the use of cross-sectional data limits the possibility of examining causal inferences, and this study could not reflect the length of social relationships in our analyses because our data were not longitudinal. Third, the most important limitation is that, because the dependent variable was measured for a longer period than the independent variables, it was difficult to establish causality. Last, future studies need to use improved methods to measure and discuss the interaction effects of health status and social relationships.

Conclusion

This study examined the association between social relationships and suicidal ideation among the elderly living alone in Korea. Social relationships were conceptualized in FSRs and ISRs as proposed by Pichler and Wallace.³⁸ In particular, FSRs were newly measured as formally constituted service providers in organizations (formal helper) and activities (social membership/participation).

Our results revealed that ISRs were significantly associated with suicidal ideation, but FSRs measured by formal helpers have no association with suicidal ideation. This result might be due to the fact that Korean older adults still rely heavily on ISRs, even though the Korean government has put forth a variety programs to prevent suicide. Findings of this study suggest that different types of social integration program should be developed in Korea.

In addition, the South Korean government has started the Third Plan for Suicide-Prevention (2016-2020) that emphasizes building social support systems and reinforcing

community capabilities to prevent suicide compared with the Second Plan for Suicide-Prevention (2009-2013), which are the most highly anticipated aspects. Now is a critical time to connect governmental policies with practical services because the Moon Jae-in administration particularly majors on suicide among mental health problems.

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Author Contributions

Hyun-Jung Kwon made a substantial contribution to the concept and design, acquisition of data or analysis and interpretation of data. Ji-Ung Jeong drafted the article and approved the version to be published. Mihyang Choi revised the article critically for important intellectual content.

Ethical Standards

The 2014 Survey of Living Conditions and Welfare Needs of Older Koreans was conducted by the Korea Institute for Health and Social Affairs and the Ministry of Health and Welfare after receiving approval from the Commissioner of the Statistics Korea. All procedures contributing to this work and research comply with the Helsinki Declaration of 1964 and its later amendments.

Informed Consent

All respondents gave their informed consent prior to their inclusion in the survey.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Notes

- i. An Organisation of Economic Co-operation and Development annual report predicted that by 2026, Korea will become a super-aged society, one in which more than 20% of the population is aged 65 or above.
- ii. Dying alone and solitary death refers to deaths with no one around during the dying person's last moment, and this happens occasionally in Korea. However, there is no specific definition accepted by academic circles.
- iii. According to the Comprehensive Support Center for the Elderly Living Alone established by the government as a national-level, around 20% of older adults living alone in Korea currently use the Basic Care Services for Older Adults

Living Alone. This is a national-level center whose aim is to prevent social isolation for safety confirmation and service connection among the elderly living alone. The program was designed to protect older adults living alone from social isolation and to provide them with support services.⁴⁴

- iv. LTCI is the program to support elderly who have physical and cognitive problems in the activities of daily living.
- v. Scholars in this field classify social relationships as formal or informal. In a broader sense, Pichler and Wallace regard social relationships as equivalent to social networks, social capital, or social support,³⁸ but they distinguish social capital from social networks; social capital mainly entails participation in formal organizations, whereas social networks are related to more informal bonds.
- vi. Fraternal organizations (eg, *Gye* in Korean) are traditional associations that collect private funds for helping others and that promote friendship.
- vii. One reviewer recommended to entering the second FSR variable into the regression models as a continuous variable instead of a dummy variable. However, there was little difference in results of regression between the two.
- viii. The proportion of the high-income earners (eg, fourth and fifth income quintile) who had severed relationships with their children reaches to 0.8% to 1.2%, which is not much different from 1.2% to 5.4% of the low-income earners (eg, first and second income quintile) (Korea Ministry of Health and Welfare, 2014).⁴⁵

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