International Journal of Applied Engineering Research
ISSN 0973-4562 Volume 10, Number 9 (2015) pp. 21939-21958

http://www.ripublication.com

Factors Related to Suicidal Ideation in Elders in Four Asian Countries: A Literature Review

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Funding support: This work was supported by Hanseo University Research Fund 2013

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Abstract

Objective: The objective of this study is to analyze factors related to suicidal ideation in elderly people based on four Asian countries' international literature.

Methods: A literature search was undertaken by using various electronic research database such as CINAHL, ISI Web of Knowledge, PubMed, Cochran, Medline Plus, PsyINFO, DBPIA, NDSL, and KISS for the period from 2000 to 2011. Nineteen references were selected and analyzed.Studies that examined and identified suicidal ideation or related factors of suicidal

ideation were eligible for this review if publication were in Korean or English and were peer-reviewed. The research had to have been conducted in Asia as quantitative. Subjects for this study had to be 60 years or older.

***Results**:* The rate of suicidal ideation ranged from 2.2% to 30.5%. Factors related to suicidal ideation were clustered into four groups: Demographic factors (e.g., marital status, economic level), Physical factors (e.g., physical health), Psychological factors (e.g., depressive symptom, stress, coping skill, self-esteem), and Social factors (e.g., community participation, social support).

***Conclusion**:* This review informs a current state of knowledge regarding factors related to suicidal ideation in four Asian countries and has implications for clinical practice. The prevalence of suicidal ideation in Asian countries is higher than western countries. This paper identifies factors such as rapidly changing social patterns that may account for these differences. Many of these factors in elderly suicidal ideation have shown to be similar to those of western culture. Health care professionals need to include suicidal risk factor screening when performing physical exams on aging patients.

Keywords: Suicidal ideation, Factors, Asian, Elderly people

1. Introduction

Suicide is one of the most serious public health problems in the world. It not only impacts families, but also society. On a personal level, suicide is an enormous trauma for families having to experience the loss of a loved one. On a social level, due to signs of the Werther Effect, the risk of copycat suicide is on the rise. In addition to the increase of suicides, the economical expense is also growing. In Korea, the socio-economical expense of suicide is three trillion eight hundred and sixty four billion Won, which is equivalent to 3.5 billion dollars per year[1].

According to World Health Organization (WHO), the highest Asian country's suicide rateamong elderly people is almost six times that of Western countries. For example, Korea has 76.8 per 100, 000 where the United States has 12.5 per 100, 000. Six out of 11 Asian countries have an increasing tendency of suicide rate that correlates with aging[2]. Elderly population has more physical illnesses, experiences complicated or traumatic grief and role changes, and retreats from social activities. Their fragile state, compounded by social isolation, often leads to fatal outcomes[3]. Many people think that the indirect signs of suicidal ideation such as social isolation, hopelessness, or complaints of health problems are a part of normal aging. Thus, there are cases where risk factors for suicidal ideation in elderly were overlooked and elderly suicide was not prevented.

At the beginning of the 21st century, there have been some evidences of declining suicide rates among older people but a recent cross-national study reported increased rates with aging in 25 of 62 countries[4]. The suicide rate for elderly ages 65 to 74 years in Asian societies has a jumped from 1.2 times in Japan to 4.0 times in

Sri Lanka which is higher than the general population[2]. In the case of Korea, people who are 60 years old and over are the most vulnerable in terms of self-destructive[5]. Over the past few decades, some Asian countries have developed rapidly. Elderly population has suffered from several personal, social, and cultural changes. Having to deal with these changes, those who have poor coping strategies and experience transitions such as depression, anxiety, or a sense of being overwhelmed are at an increased risk for suicide[6].

Most studies of suicidal thoughts have been conducted within individual western countries[7-10]. However, the number of studies in English investigating the characteristics of elderly suicidal ideation in Asian population is limited. In addition, it is not known whether prevalence estimates and factors related to suicidal ideation identified in such studies generalize beyond these Asian countries.Even in South Korea, elderly people in particular are more limited than that in younger people because the elderly suicide goes against the cultural respect for elderly. There is a lack of research in this area due to South Korean society's tendency to hide discussions about elderly suicide and to think that death of old age is an inevitable but natural part of life[11]. It is true that suicidal elders share common features with suicidal younger adults; however, the unique life experiences of elderly people might effect the manners in which they experience, report, and act upon suicidal ideation[12]. Consequently, it has not been possible to determine whether there is a difference between the magnitude and characteristics of elderly's suicidal ideation in Asian countries. It is necessary to develop more sophisticated methods for synthesizing and using the information obtained about such factors in order to implement early interventions in elderly suicidal ideation.

This literature review aims to compare the prevalence of suicidal ideation and to synthesize the related factors of suicidal ideation in aged people in Asian countries. It looks at the current state of knowledge of studies conducted in Asian countries, taking socio-cultural contexts into account in order to raise health related professional knowledge and skills when caring for people who have suicidal ideation. All in all, this will enhance an understanding of suicidal ideation in elderly people in Asian countries.

2. Method

2.1. Search strategies

An English literature search was conducted using the following electronic databases: CINAHL, ISI Web of Knowledge, PubMed, Cochran, Medline Plus, PsyINFO, and the Nursing Consult by Mosby. A Korean literature search was conducted using the following electronic databases: DBPIA, NDSL, and KISS. Such terms included suicidal ideation, suicidal thought, suicidal, risk factors, protective factors, factors, and Korea, Korean, Japan, Japanese, China, Chinese, Taiwan, Taiwanese, Singapore, and Asian were entered separately and in combination during search from May 29–June 3, 2011.

2.2. Inclusion and exclusion criteria

The inclusion criteria included any study that examined and identified suicidal ideation or related factors for suicidal ideation research that was published between the year 2000 and 2011 in Korean or English. These publications were peer-reviewed of research that were conducted in Asia and looked at quantitative. Subjects for this study were 60 years or older even though the general cutoff age for elderly is 65. However, this review adopted the age of 60 since that is considered a pivotal age in Korea and is also the age when one begins to receive a national pension. Using reference lists of published journal articles retrieved additional articles. The authors reviewed abstracts and full texts to decide upon their inclusion and exclusion<Figure 1>.

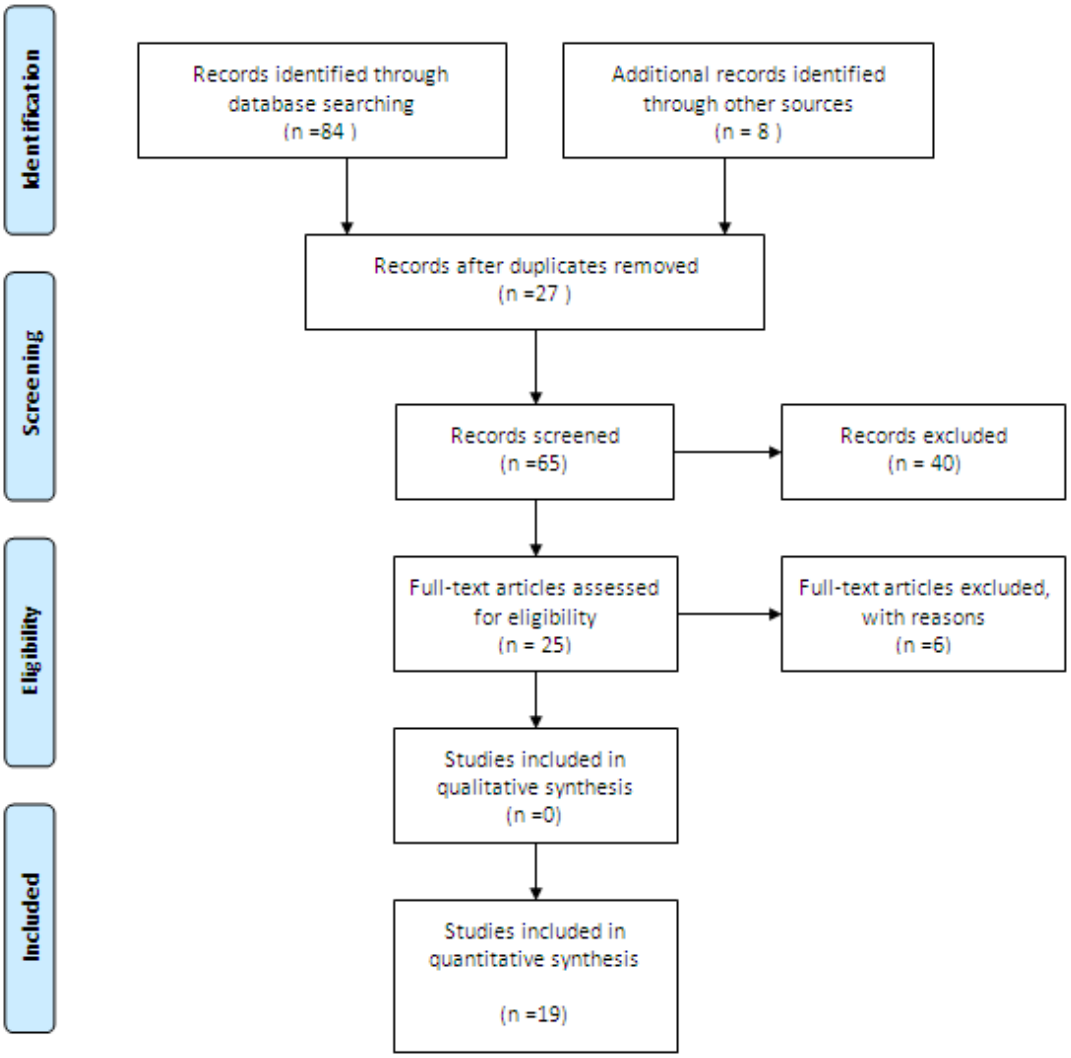

Figure 1. PRISMA Flow Diagram for studies included

3. Results

The search strategy resulted in 92 abstracts related to suicidal ideation. Subsequently, 27 studies were duplicated by electronic database, and 46 were excluded because they did not fulfill the inclusion criteria. Nineteen research articles conducted in four Asian countries were identified and included in this review. These studies were conducted in Korea (n=14), which two of the 14 studies published in English and twelve published in Korean; Japan (n=2); Taiwan (n=2); and China (n=1). The majority of the studies collected cross sectional data cross (n=15), and the others were secondary data analysis (n=4). There was no longitudinal study. The methods of sampling were convenience (n=12), stratified multistage probability (n=5), random (n=1), and total population (n=1) with sample size from 174 to 30, 666. The areas of sampling were urban (n=11), rural (n=6), and mixed area (n=2).

3.1. Measurement of major variables

Several measurements were used to determine suicidal ideation in aged people in Asia<Table 1>. The most frequently used measurement of suicidal ideation was the Scale for suicidal ideation (SSI) of Beck (n=5), followed by Suicidal Ideation Scale of Harlow (n=3), Composite International Diagnostic Interview(CIDI) (n=1), Positive and Negative Suicide Ideation inventory(PANSI) of Osman (n=1), and the Geriatric Mental State Examination version A (GMS-A) (n=1). Furthermore, one study used a combination of SSI and Suicidal Probability Scale of Cull& Gill. Seven studies used a single question about the presence of suicidal ideation within the last week (n=1), last month (n=1), last year (n=4), and no mention when respondent had a symptom (n=1). The major measurement of depressive symptom used was Geriatric Depression on Scale Short Form(GDSSF) (n=4) and Geriatric Depression Scale(GDS)(n=4), followed by Taiwanese Depression Scale (n=2), Single Question (n=2), Zung Depression Inventory (n=1), Center for Epidemiological Studies Depression Scale (CES-D) (n=1), Templer's Death Depression Scale (n=1), and Self rating Depression on Scale (SDS) (n=1).

3.2. Prevalence of suicidal ideation in aged people in Asian

The rate of suicidal ideation varied depending on the measurement tool and time frame used<Table 1>. With single question, the rate ranged from 4.5% in Japan[13] to 30.5% in Korea[14]. Comparing to the previous years in Korea, the rate of suicidal ideation with single question increased from 17.7% in Korea[5] to 30.5%[14]. When CIDI tool was used for psychometric measurementin Japan, it measured 2.2%[15]. Korea used SSI of Beck tooland it estimated 13.9%[16].

3.3. Related factors for suicidal ideation in aged people

The complexity of suicidal ideation includes contributions from demographic, physical, psychological, and social factors<Table 2>.

Demographic factors: Gender, age, marital status, education, and economic status were considered related factors in suicidal ideation in elderly. Five of seven articles show that females had a higher risk of having suicidal ideation than males[5, 17-20].

Age was a relevant in suicidal ideation with younger elderly people having more prevalence to suicidal ideation than older elderly people[21-22]. However, two studies showed that the older elderly people are more prevalentto suicidal thoughts than younger elderly people[17, 23].

Marital status was shown to be a protective factor against suicidal ideation[20]. Not being married[14, 19] or being widowed[17-21, 24]plays a significant factor. However, one study[19] showed that marital status was not a significant factor of suicidal ideation after controlling other demographic variables.

Another factor is level of education[17, 19]. Five of 13 studies show that the group with lower level of education or illiterate have a higher prevalence of suicidal ideation over time in both men and women[14, 17-19, 25]. Contrary, one study shows that a highlyeducated elderly people had a higher score of suicidal ideation than other elderly people[24]. The level of education was a predictor of suicidal ideation[17, 19], and illiteracy was associated with a two–fold increase in the risk of suicidal ideation[19]. In addition, seven studies showed that the educational level was not significant factor[13, 16, 20, 22-23, 26-27].

Income or the economic status was a predictor of suicidal ideation[17, 26]. The lower economic level was related to higher suicidal tendency[17, 19-21, 24-26, 28].

Physical Factors

Physical health, pain and disease: Eleven of 13 studies stated physical illness or perceived health as a related factor of suicidal ideation in elderly people[13-14, 17-21, 23-24, 26, 28]. After adjusting for age and controlling for depression, self-perceived health status was at a higher risk of having suicidal ideation[23, 26, 28]. Self-perceivedhealth was a predictor of suicidal ideation[14, 17, 23, 26]. However, Yen et al., [19] showed that physical illnesses were not a significant predictor but is related to suicidal ideation. Kim and Choi[21]showed that physical health was a significant predictor of suicidal ideation depending on the presence of depressive symptom. If people have depressive symptoms, they are more likely to have physical illness and suicidal ideation.However, if people have not had depressive symptoms, even though they do not have physical illness, they are less likely to have suicidal ideation. A few studies reported that smoking[14, 18], sleep deficiency[13-14], and history of hypertension were major predictors of suicidal ideation[16].

Psychological Factors

Depressive symptom, depressive disorder or mood disorder: Depressive symptoms and major depressive episodes were the strongest predictor in suicidal ideation[13-14, 19-29]. These symptoms were associated with a 7.2-fold[23] to a 15.5-fold[19] increase in the risk of suicidal ideation. Moreover, severe depressive symptoms versus the absence of depressive symptoms were associated with a 34-fold increase in the risk of suicidal ideation after controlling other socio-demographic and health-related variables, major depressive episode versus depressive symptoms without any psychiatric diagnosis conferred a 37.5-fold increase in the risk of suicidal ideation over a two-week period[13].

Participants who have thoughts of death or suicide have significantly higher depression score(Self-rating Depression Scale: SDS) and symptoms on the Composite International Diagnostic Interview (CIDI-MD-R) than participants who had neither thoughts of death nor thoughts of suicide[15].

Stress: Stress was one of the related factors of suicidal ideation[5, 14, 20, 24, 26, 28-30]. Various studies have shown that stress has a direct effect on suicidal ideation and indirect effects through self-esteem and depression[26] and through coping style[30].Other studies stated that stress did not have a direct, significant effect on suicidal ideation but has shown that it was the second most influential variable in total effect on suicidal ideation[29].

Coping skill: Coping skills were significantly related to the risk. Specifically, those who used fewer active coping skills, which dealing with the problem that was causing the emotional stress, are at higher risk for suicidal ideation[20, 28, 30]. The coping strategy of stress was mediating factor in their relation between the elderly's stress and suicidal ideation[30].

Hopelessness and Self-esteem: In a comparative study on suicidal ideation between elders and teenagers, hopelessness was one of the prominent factors in elderly's suicidal ideation, and the effect of hopelessness on suicidal ideation was shown to be greater in elders than in teenagers[29]. However, one study showed that hopelessness was not a related factor[25]. Whereas self-esteemwas a predictor of suicidal ideation[25-27].

Cognitive status: Suicidal ideation had a negative correlation with cognitive status (MMSE-KC)[16], but cognitive status was not a predictor in people who have higher suicidal ideation[13, 16].

Social Factors

Labor or Community participation: The community participation was a predictor of suicidal ideation[14, 18-19, 25, 27]. If suicidal ideation was high, community participation was not a protective factor for women, those living alone, or for depressed subjects[19]. The labor market participation was protective against suicidal ideation in men but not in women[17].Additionally, limited activity or impaired activity of daily living(IADL) was a significant risk factor for suicidal ideation[13, 20].

Social support: Social network, with its abundant resources, not only brings positive benefits but also promotes individual health[19]. Social support was one predictor[13, 22] and protective factor of suicidal ideation[13, 20, 22-23, 25, 27].Having a social support network can reduce the risk of suicidal ideation by as much as 60%[23].

Living arrangement: Living alonewas significantly associated with suicidal ideation in men but not in women. In contrast, living in a multigenerational family without a

spouse impactedboth men and women[17]. However, living arrangement and living alone were not a significant factor[13, 20, 24-25, 28], nor predictor of suicidal ideation[19].

4. Discussion

Given the severity of suicidal ideation in elderly, methodological limitations in existing literature need to be addressed. In particular, the most used measurement of suicidal ideation was the single question of whether one hasever thought of taking one's life during the past year, month, and week.Moreover, the time frame to have had suicidal thoughts varied considerably from one week to one year.

These measurement tools have been translated into many different languages, but most studies that used suicidal ideation measurement tools were not standardized nor validated in the new language. Most of the studies reported reliability, but only one study reported validity, sensitivity, and specificity of measurement tools. The Cronbach's α of reliability of measurement tools ranged from.67 to.98. There was no mention of a cutoff score for the measurement instrument that was used.

Direct comparison of prevalence with the Asian countries from other countries was difficult due to the difference in measurement tools used. For example, the studies used the scale for suicidal ideation of Beck, Suicidal ideation scale of Harlow, Composite International Diagnostic Interview (CIDI), Positive and Negative suicide ideation inventory (PANSI) of Osman, and the Geriatric Mental State Examination version A (GMS-A) and suicidal ideation was assessed by the single question which differs from the questions about suicidal ideation. However, Korea had the highest suicidal rate among the four Asian countries. This finding was consistent with other studies that suggested the prevalence of suicide was highest in Korea, at 19+ deaths per 100, 000[2].

This literature review on multinational suicidal ideation reported that the past year prevalence of suicidal ideation varied by countries, with rates of 2.2% in Japan[15] to 30.5% in Korea[14]. Theseoccurrences were higher than the lifetime degree of suicidal ideation in western countries, with rates of6.1% for ages 65 to 74 and 6.9% for 75 years and older in Australia[8], from 7% to 11% in the year among Austria elderly people[9], from 3.0% to 15.9% among general population in 17 countries[31], 2.1% in Lebanon, and 18.5% in general population in New Zealand[10].

Differences in suicide rates of various nations can be understood through cultural and social explanations. The current high rate of suicidal ideation in Asian elderly can be attributed to two various factors. First, there are disproportionately high social disparities in Korean elders.The elderly generation of Asia today is less educated. Compared torecent generation, the older generation has received less technical training in accordance to industrialization. In the past, people lived in an agricultural society where people were able to survive without the need to learn special skills; however, current society demands people to know various technical skills, and people experience more stress as it becomes highly competitive. In addition, they do not have retirement plans.

Confucianism influenced both Korea and China, so the elderly were respected and given social courtesy, and as a society of extended families, it was a society where younger generation had supported the older generation. In Korea and China, though, the society has seen a change in which the prevalence of extended families has reduced substantially while the nuclear family has become the norm.

In addition to social disparity, the social security for the elderly is scarce. In Korea, only 27.6% of individuals 65 years and older receive public pension[32]. Hence, the disparity of the social standing is severe when compared to today's generation. As a generation lacking social support, they experience suffering due to social and economic inequalities.

Today's elderly generation is a generation that has experienced diverse historical difficulties. They have suffered various trauma and psychological distress as they have gone through myriads of wars, lived through poverty as children, and experienced rapid industrial and political changes in adulthood. Yet, they are struggling once again to adapt to the flow of the new generation, even in their old age.

In the studies reviewed of Asian elderly, there was no gender difference in expressed suicidal ideation. Five of seven studies showed more suicidal ideation in females. Of the five, three were in Korea, one in China, and one in Taiwan.

Measurements of suicidal ideation appeared to be different in younger elders compared to older elders depending on whether a single question or a psychometric instrument was used. Two studies that younger elderly had higher suicidal ideation than older elderly used psychometric measurement. In addition, two studies that older elderly had higher suicidal ideation than younger elderly used single question. Therefore, in the case of older elderly, they carefully answered short questions, but psychometric measurement that contained too many questions that required concentration for long periods of time may have influenced how the elderly answered the questions. A second possibility is that research studies examining age, as a risk factor, did not take dementia or cognitive function into consideration. As elderly gets older, their responsemay be impacted due to dementia orcognitive function; consequently, can cause a problem in reliability.

Marriage seems to be a protective factor against suicidal ideation. The finding was consistent that being single and widowed were associated with suicidal ideation among the general population[33]. In fact, these factors have been identified in various studies among general population in Asian[34] and Western countries[35].

Regarding education, research showed that more than half stated that the level of education was not associated with suicidal ideation. Different from education, eight out of 12 studies showed that lower economic status is associated with suicidal ideation. For future research, it is important and necessary to incorporate education and economic levels, and examine how they are associated with suicidal ideation.

There are multiple reasons for suicidal ideation, but the major factor found to be associated with and predictive of suicidal ideation was depression or depressive symptoms.This finding was consistent with the results that the difference between people who had suicidal ideation and people who did not have suicidal ideation with respect to each kind of depressive symptom was statistically significant in Vietnamese general population[34]. The presence of major depressive disorder was associated

with 4.3 times in Korean general population[36] to 17.8 times higher odds of suicidal ideation in Chinese general population[37]. Depression conferred more than 21.6 times increase in the risk of suicidal ideation in Taiwanese general population[38].

The finding that depressive symptoms or depression in Asian elders was a predictive factor or associated with suicidal ideation was consistent with the western studies' result that depressive symptoms was significantly related to increased risk of suicidal[7-8, 31, 39].Barnow and Linden[7] reported that major depression conferred more than 40-fold increase in the risk of suicidal ideation in subjects aged 70 years and over. In Australia, depression increased up to three times higher in probability of having experienced suicidal ideation[8]. In the studies across 17 countries over Africa, America, Europe and Asia, mood disorder increased from 3.4times to 4.7times the risk of suicidal ideation in general population[31].Major depression explained from 21.1%[38] to 52%[40] to 53.8%[39] of variance of suicidal ideation in a regression equation. Even though depression and depressive symptoms was a strong risk factor, depression among the elderly was very much neglected and untreated in the community[20]. This would suggest that the depressive symptom was a common risk factor in suicidal ideation in Asian and Western countries. It is important to identify these depressive symptoms to prevent suicides among aged population.

Moreover, poor physical health status and physical illness were common risk factors. This finding was consistent with that of the total number of somatic symptoms[41] and chronic illness[40] were higher for those with suicidal ideation than for those without suicidal ideation. It predicted suicidal ideation among general population. In western studies, univariate analysis suggested that elderly people who had suicidal thoughts were more likely to report poor health[42]. The psychological distress is often hidden behind somatic complaints like masked depression. The depressive elderly with suicidal ideations tend to complain of somatization symptoms such as chronic pain and physical symptoms, which make them and others overlook their depressive symptoms. Therefore, health care professionals working in medical care settings for elderly people should pay attention to suicidal ideation when treating somatically ill patients.

In comparison to what has been researched on adolescents regarding suicidal tendency, an American study found that high school students with minor physical symptoms of stress were not likely to suffer more from suicidal ideation once the effects of depression were controlled[43]. Therefore, physical health and chronic illness are variables that are more closely associated with elderly.

The finding that stress was a risk factor of suicidal ideation was consistent with the report that negative life events increased the risk of suicide among Swedish seniors over the age of 65[44]. People who are exposed to fewer life stressors and who are better able to adjust to life transitions may be at a lower risk of suicide[33]. The presence of severe acute stress was the main risk factor of suicide. A group with high levels of chronic stress has 37.6 times more probability to commit suicide than a group with low levels of chronic stress. Likewise, a group with high levels of acute stress has a probability of 34.5 times in autopsy study[45].

Two studies that used hopelessness as a variable suggested conflicting views. Hopelessness was supported by one result. This finding was consistent with a study

that suggested that hopelessness was associated with suicidal ideation among general population in China[40] and Sri Lanka[46]. Hopelessness explained a total of 40% of the risk of suicidal ideation without adjustment for covariates and was explained a total of 19% of the risk of suicidal ideation with adjustment for covariates[40]. Along with suicide attempts as well as completed suicide and other similar forms of suicidal acts, hopelessness has been reported to be important in forecasting important psychological risk factors[47].

Furthermore, labor market participation was a protective factor in men but not in woman. According to society, men play more of an important social role in the labor market than women; thus, are protected against suicidal ideation.

Social support was a protective factor consistent with the result that less social support was associated with both passive and active suicidal ideation[48]. In a grounded theory study on patients who attempted suicide and their families, it showed the results that one of the context elements was family environment, including relationships within the family, and one of the intervening conditions was support system[49].

Indeed living alone was significantly associated with suicidal ideation in men but not in women. When their spouses die, men lose many of the benefits that their wives had provided such as emotional support and maintaining of social contact with children and others[50]. On the other hand, women can adapt to their changed environment. This pattern among those living alone reflects the traditional norms governing the roles of gender.

Living arrangement; however, was not a predictive factor or associated with suicidal ideation. Based on these results, we can speculate that, in both Eastern and Western societies, it is not about whether a person lives alone or whom that person lives with, it is about how much social interaction a person experiences and how much people feel loneliness.

In conclusion, Asian elders have shown higher suicidal ideation than Western elders. Related factors have shown to be similar in both Asian and Western elders' suicidal ideation risk and protective factors. This paper has identified issues such as rapidly changing social patterns that may account for these differences. Also, the measurements of suicidal ideation were only translated into each respective languages and therefore, not measuring validity nor reliability.

Several limitations should be considered when interpreting these results. First, all studies examined in peer review journals were published in English or Korean. However, few publications acknowledged in China (1), Taiwan (2), and Japan (2)was published in English. Articles published in other Asian languages were excluded. Therefore, these findings are limited to these countries only and do not provide a representative view of each country. 12 of 19 studies included used convenience samples and cannot be generalized to the country of origin.

In regards to journals, we verified that all studies were published inpeer-reviewed journals to enhance the quality of the research. We cannot examine internal validity of the research findings so these may be subject to misreporting.

Lastly, there may be cultural differences in the willingness to report on suicidal ideation across the four Asian countries. In the case of Korea, elderly people

are reluctant to report their suicidal thoughts due to the negative stigma. However, we could not find whether other Asian countries were as disinclined to report suicidal ideation or not. The factors that influenced the Korean studies may have been present in the Chinese, Japanese, and Taiwanese studies as well and may constitute a limitation in the findings.

It is well established that suicidal ideation in Asian countries is more prevalent than in Western countries.Asian health care professionals need to become more aware of this phenomenon in order to provide effective prevention and interventions in a timely fashion.

On the aspect of primary prevention, awareness campaign and education are needed for public and healthcare professionals regarding the risk factor as well as physical factors (perceived health status or chronic illness), psychological factors(depressive symptom, stress, self-esteem, and coping skill), and social factors(participation in community, social support) for elderly suicide.

In terms of secondary prevention, home visiting nurses or other health care professionals need to include suicidal ideation risk factor screening when performing physical exams on elderly patients.

In the previous intervention studies, the multisite Prevention of suicide in Primary Care Elderly: Collaborative Trial (PROSPECT) tested the impact of a primary care based intervention on reducing major risk factors for suicide in late life[51]. Lynch et al.[47] examined the effectiveness of Dialectical Behavioral Therapy (DBT) in depressed adults 60 years and older. Levels of depression decreased among participants receiving either DBT alone or DBT plus antidepressant medication.However, the effects on suicidal ideation were not statistically significant. Interpersonal Psychotherapy (IPT) alone or with antidepressants may be effective in helping to reduce suicide ideation among older adults[52]. On the contrary, these studies focused on depression intervention.As such, in order to reduce elderly's suicidal ideation, medical professionals need to develop a comprehensive intervention program that mediates not only depression, but also addresses variables that influence elderly suicide and application these programs.Instead of focusing on elderly's living arrangements, it is essential to understand that elderly's quality of social interaction or loneliness is a risk factor that influences suicidal ideation; therefore, we need to initiate various outreach and social support programs that will prevent suicidal ideation in elderly population. Many of these factors are similar to Western and general population, which implies that many of the similar prevention and intervention measures, may be used.

In short, a comprehensive intervention program needs to be developed and applied in Asian countries. Improvements in our ability to predict and prevent suicidal ideation are needed and require that we continue to identify the factors related to suicidal ideation. In addition, better and more sophisticated model for explaining and predicting suicidal ideation needs to be developed.

Recommendation for future research would involve the measurement tools of suicidal ideation to be validated and standardized in each country. The inclusion of data from additional countries in future work conducted by a national organization such as WHO will significantly enhance our understanding of the factors influencing

suicidal ideation. Further research must synthesize the studies, which examine the factors related to suicidal ideation in Asian elderly people undertaken in their respective languages. Pilot studies need to examine the effectiveness of comprehensive intervention program in order to reduce the risk factors of suicidal ideation in elderly people. Once that has been observed, additional research must examine suicide prevention program's effect size based on the meta-analysis. Therefore, these results of meta-analysis need to be applied to the research of suicide prevention program in Pan-Asian elderly people.

<Table 1> Description of Literature Review

Nation	Korea									
Reference	[5]	[14]	[16]	[17]	[18]	[21]	[22]	[24]	[25]	[26]
Language	English	Korean	Korean	English	Korean	Korean	Korean	Korean	Korean	Korean
Design	Secondary data analysis	Secondary data analysis	Cross sectional	Secondary data analysis	Secondary data analysis	Cross sectional	Cross sectional	Cross sectional	Cross sectional	Cross sectional
Sampling	Stratified multistage probability	Stratified probability	Convenience	Stratified multistage probability	Stratified multistage probability	Convenience	Convenience	Convenience	Convenience	Convenience
Sample size	30,666	1,097	179	930	778	302	800	201	174	183
Setting	Metropolitan, Urban, Rural	Metropolitan, Urban, Rural	Urban	Metropolitan, Urban, Rural	Metropolitan, Urban, Rural	Urban	Urban	Urban	Urban	Urban
Population	≥ 60	≥ 65	≥ 60	≥ 65	≥ 65	≥ 60	≥60	≥ 60	≥ 65	≥ 65
Measurement of Major variables	SI:Single Question(past year),	SI:Single question (past one year)	SI:Beck's SSI	SI: Single question (past year)	SI:Single question (past one year)	SI:Beck's SSI	SI:Harlow's Suicidal Ideation Scale	SI:Beck's SSI	SI:Harlow's Suicidal ideation Scale,	SI:Harlow's Suicide ideation Scale
		Dep: Single question	Dep: GDS		Dep: Single question	Dep: CES-D Korean version	Dep:GDS-K	Dep: GDSSF-K	Dep: GDSSF-K	Dep: GDSSF-K
Prevalence of SI(%)	17.7-23.6(M) 28.7 - 36.8(F)	30.5	13.9	23.2(M) 30.6(F)	27.7		11.3 (SIS≥ 11)			
Factors associated with suicidal ideation	Gender(F)	Depressive symptom, Stress, Mobility, Pain/discomfort Number of chronic illness, Smoking, Sleep deficiency, Leisure time physical activity, Gender(male), Education (none) Marital status (unmarried)	History of hypertension*, MMSE(negative correlation)	Gender(female), Low income, Uneducated, Economic status(Poor), Inactive labor market participation, Living with a multigenerational family without spouse, Age(>75years), Number of physical illness, Self rated health	Gender(female), Education status(low), Stress, Depressive symptom, Smoking, Subjective health status, EuroQol-5 Dimensions Kinetic ability, Self management, Daily activity, Pain/Discomfort Anxiety/Depression, Restriction of activity, Marital status (Widow), Status of dietary life	Depressive symptom*, Interaction effect between physical health and depressive symptom*, Gender(Male)*, Maritalstatus (Widow)*, Age(younger)*, Economic status, Perceived health status	Depressive symptom*, Age(-)*, Characteristics of social network(the amount of helping from outside) *	Depressive symptom†, Stress†, Education†, Marital status (widow), Income(low), Perceived health status	Depressive symptom*, Selfesteem*, Family cohesion*, Discrimination against the elderly*, Participating social activity*, Education, Religion, Economic status	Depressive symptom‡, Stress‡, SelfEsteem‡, Perceived Health Status‡, Economic level ‡
Other	*Predictor					*Final model Predictors	* Final Model Predictors	†Multivariate logistic regression Predictors	* Final Model Predictors	‡Path Analysis Predictors

Si: Suicidal Ideation, Dep: Depression

<Table 1 cont> Description of Literature Review

Nation	Korean				Japan			Taiwan		China (HongKong)
Renference	[27]	[28]	[29]	[30]	[13]		[15]	[19]	[23]	[20]
Language	Korean	Korean	Korean	Korean	English		English	English	English	English
Design	Cross sectional	Cross sectional	Cross sectional	Cross sectional	Cross sectional		Cross sectional	Cross sectional	Cross sectional	Cross sectional
Sampling	Convenience	Convenience	Convenience	Convenience	Total population		Convenience	Multilevel stratified sampling	Convenience	Random sampling
Sample size	241	431	221	285	1,145	229	353	1000	1347	917
Setting	Urban	Urban	Urban	Urban	Urban		Rural	Rural	Rural	Rural
Population	≥65 living alone	≥ 60	≥ 65	≥ 60	≥ 70	GDS 14+ and MMSE 18+	≥65	65-74	≥ 60	≥60
Measurement of Major variables	SI: Beck's SSI	SI:PANSI	SI:Beck's SSI	SI:Modifed Scale	SI:Single question	SI::Single question (over 2-week period)	SI:CIDI-MD-R	SI:Single question(the preceding week)	SI:Singel question (within past month)	SI:GMS-A
	Dep: GDSSF-K	Dep:DDS	Dep: Zung	Dep: GDSSF-K	Dep:GDS Japanese version		Dep: SDS and CIDI-MD-R	Dep:TDQ	Dep:TDQ	Dep:GDS
Prevalence of SI(%)					4.5 (M:3.8, F:5.1)	15.4 (M:9.2, F:18.2)	2.23 2.2 (longer than 2weeks)	16.7	17.8	5.5 (Depressed Group:25.9)
Factors associated with suicidal ideation	Depressive symptom*, Family Structure(live with children or grandchildren)* The participation into social activities*	Depressive symptom‡, Intrapersonal Anxiety‡, Interpersonal Anxiety‡, Economic status, Health status	Depressive symptom, Stress, Hopelessness	Stress‡, Coping strategy ‡	A lack of perceived social support, Multiple physical illnesses, Pain, Subjective perception of poor health, Impaired physical functioning Impaired IADL , Sleep disturbance, Depressive symptoms, A lack ofsocial support †, Impaired IADL(Multivariate analysis, control for depressive Symptom)†, Depressive symptom(Univariate analysis, control for factors other than depressive symptoms)†		Depressive symptom	Depressive symptom†, Educational level(illiterate) *Community participation†, No religious belief, Unemployed, Marital status(Single or widowed), Income(low), Physical disease	Self- perceived health*, Accessibility (difficulty in gaining medical resources)*, Marital discord*, Depressive symptom*, Emotional social support	Sex(female), Marital status (widowed) Self rated poor financial state, Self rated poor physical health, The number of chronic disease*, Mental health, Depressive symptom*, Vision problems* Hearing Problems* Having problems with ADLs and IADLs, The lack of social support, The frequency of seeing a doctor, Life event, Coping skill
Other	* Final Model Predictors	‡Path Analysis Predictors		‡Path Analysis Predictors	†Multivariate logistic regression Predictors			†Multivariate logistic regression Predictors	* Final model Predictors	* Final model Predictors

SI: Suicidal Ideation, Dep: Depression

Table 2. Factors related to Suicidal Ideation in Elderly People

			Korea														Japan		Taiwan		China
	Variables		[5]	[14]	[16]	[17]	[18]	[21]	[22]	[24]	[25]	[26]	[27]	[28]	[29]	[30]	[13]	[15]	[19]	[23]	[20]
Demographic Factors	Gender	SE	*	*	*	*	*	*	*	*	*	*	*				*		*		*
		SI	V	V		V	V	V											V		V
	Age	SE		*	*	*	*	*	*	*	*	*	*				*			*	*
		SI				V		V	V											V	
	Marriage	SE		*			*	*	*	*			*				*		*	*	*
		SI		V			V	V		V			V						V		V
	Education	SE		*	*	*	*		*	*	*	*	*				*		*	*	*
		SI		V		V	V			V	V								V		
	Economic status	SE		*		*	*	*	*	*	*	*	*	*					*		*
		SI				V		V		V	V	V		V					V		V
Physical Factors	Health status	SE		*		*	*	*	*	*		*	*	*			*		*	*	*
		SI		V		V	V	V		V		V		V			V		V	V	V
	Smoking	SE		*	*	*	*										*				
		SI		V			V														
	Sleep disturbance	SE		*													*				
		SI		V													V				
	Hypertension history	SE			*																
		SI			V																
Psychological Factors	Depressive symptom	SE		*	*		*	*	*	*	*	*	*	*	*		*	*	*	*	*
		SI		V	V		V	V	V	V	V	V	V	V	V		V	V	V	V	V
	Stress	SE		*			*			*		*			*	*					*
		SI		V			V			V		V			V	V					V
	Coping	SE														*					*
		SI														V					V
	Hopelessness	SE									*				*						
		SI													V						
	Cognitive function	SE			*												*				
		SI			V																
	Self esteem	SE									*	*	*								
		SI									V	V	V								
Social Factors	Community Participation	SE		*		*	*		*	*	*		*				*		*		*
		SI		V		V	V				V		V				V		V		V
	Social support	SE							*		*		*				*			*	*
		SI							V				V				V			V	V
	Living arrangement	SE				*				*	*	*					*		*		*
		SI				V													V		

SE: Selecting variables, SI: Significant variables

5. Conclusion

Although there have been studies on suicidal ideation, there have not been a comprehensive review of elderly suicidal ideation in Asian countries. This review synthesized factors related to suicidal ideation and other risk factors such as depressive symptoms, health status, stress, and social support. These factors are similar to those in western countries.Other factors such as social change may be a cause for higher suicidal thoughts. For example, Korean elders have undergone rapid social change and therefore, have a higher prevalence than other Asian countries.

The studies that measured depressive symptoms showed it being a strong predictor. However, not all research measured depressive symptom. Further studies should include this variable. In addition, the rate of suicidal ideation was higher when measured along single question than other structured measurement tools such as SSI of Beck. Because of elder's cognitive function, it may interfere with their response to having suicidal ideations. The length and number of questions used may impede them to fully answer. Researchers need to check respondents' cognitive ability before answering. It is necessary to develop a more comprehensive intervention program.

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