

# International journal of crisis & safety

2017 2(4)

<Index>

1. Study on Improving the Function of Senior Citizen Centers at RISK in KOREA  
/ **Kang Eun-mi, Lee Young-chul**
2. A Virtual Study on the EMERGENCY MEDICAL Facility in Disaster Site  
/ **Yoon You-sang, Lee Young, Suh Sang-wook**
3. Assessing the Core Criteria for Optimal Regulation of the Private SECURITY Industry in Republic of KOREA  
/ **Kim Dae-woon**
4. Attachment SECURITY and Behavioral Problems of Middle Childhood Boys in Republic of KOREA  
/ **Kang Su-jeong, Choi Eun-jung, Yi Soon-hyung**

**J-INSTITUTE**

Publication state: Japan  
ISSN: 2189-7603

Publisher: J-INSTITUTE  
Website: <http://www.j-institute.jp>

Corresponding author  
E-mail: [sonata0306@hanmail.net](mailto:sonata0306@hanmail.net)

Peer reviewer  
E-mail: [editor@j-institute.jp](mailto:editor@j-institute.jp)

<http://dx.doi.org/10.22471/crisis.2017.2.4.01>

© 2017 J-INSTITUTE

## Study on Improving the Function of Senior Citizen Centers at RISK in KOREA

Kang Eun-mi<sup>1</sup>

*Dongbang Culture University, Seoul, Republic of Korea*

Lee Young-chul<sup>2\*</sup>

*Dongbang Culture University, Seoul, Republic of Korea*

### Abstract

*The aim of this research is to study the functions of senior citizen leisure and welfare centers that are autonomously managed and operated by senior citizens in order to contribute to senior citizens' ability to live a healthy life in their old age. Based on December 2016 statistics, there are 3,369 senior citizen centers in Seoul with approximately 7 or 8 in each 'dong'(administrative unit). There are approximately 68,000 centers nationwide, making South Korea's senior citizen centers the most accessible in the world. Moreover, it can also be considered a social overhead capital as an excellent delivery system of senior welfare through its undertaking of beautiful and fine customs as well as delivering culture. This study conducted a survey of presidents from 3,369 senior citizen centers between the periods 2016. 4. 1 and 2016. 6. 30 in Seoul and analyzed 3,100 valid samples. The SPSS/WIN 21.0 program was utilized for data analysis. The goal of this research is to propose a solution that can secure effective management capabilities by improving the functional operation system of senior citizen centers, which is projected to contribute to strengthening senior citizen centers' quality management.*

**[Keywords]** *Senior Citizen Centers at Risk, Leisure and Welfare Facilities for Senior Citizens, Improving the Function of Senior Citizen Centers, Complete Enumeration Survey of Senior Citizen Centers, Operating Models of Senior Citizen Centers*

## 1. Introduction

### 1.1. Need for research

South Korea, 17 years after entering an aging society in 2000, has become an aged society. According to the Ministry of Public Administration and Security, among the 51,753,820 registered citizens of South Korea in August 2017, those over 65 years of age took up 14.02% of the total with a number of 7,257,288. The United Nations defines a society an aging society when those who are 65 years old or more are at least 7% of the total population, aged society when it is at least 14%, and super-aged society when it is over 20%. The ratio in South Korea of those that

are 65 years old or more has increased consistently, with 10.2% in 2008, 12.2% in 2013, and 13.5% last year[1].

With the rapid trend of aging, interest in senior citizen centers, leisure and welfare facilities for the elderly, increased and consistent studies to find methods to vitalize them were conducted. Although there have been studies on strengthening the function of senior citizen centers and a new paradigm to create a future image for them, studies that solve actual problems that arise when operating a senior citizen center, reflect future needs, and provide alternative plans to make senior citizen centers with a positive, productive image are rare. While existing research provides solutions to vitalize senior welfare

centers by operating educational/leisure programs, improving facilities, etc. and thereby improving the satisfaction level, this study analyzes the problems that arise on the field while operating senior citizen centers and their solutions by designating operating managers actually involved in the senior citizen center business[2].

The results of this study are expected to be utilized as baseline data for observing the real and current operation systems of senior citizen centers in Seoul, while contributing to strengthening senior citizen centers' quality management by providing ways to secure an effective management capabilities through functional management system improvement[3].

## **1.2. Research question**

Based on the research and analysis of operation conditions of senior citizen centers, this research question considered necessary preparation factors so that senior citizen centers can carry out a desirable function in the future. Then, it was formed into a question that looked for a standard model for senior citizen centers.

First, in order to analyze the current operation conditions of senior citizen centers, v results of various existing actual condition surveys on senior citizen centers and existing studies were combined and organized.

Second, the current condition of operation of senior citizen centers in Seoul and their policies were examined.

Third, a survey and interview of operation managers of senior citizen centers in Seoul were conducted regarding the current operation condition of senior citizen centers and opinions on improvement(budget, program satisfaction level, opinions on current and future center management) in order to analyze the problems in operating senior citizen centers and their causes, while proposing opinions on future functions and direction of senior citizen centers.

Fourth, this research focused on finding an operation model for senior citizen centers that can improve the effectiveness of policy

based on current policies related to senior citizen center management in Seoul.

## **1.3. Research method**

### **1.3.1. Data analysis and literature research**

In order to understand the current condition of senior citizen centers in Seoul, materials on support history for senior citizen centers in Seoul were utilized such as internal material from the Korean Senior Citizens Association's Seoul Federation, statistics data from Seoul-related websites, and administrative material from local related organizations. Moreover, among reports of research centers, research papers and policy reports related to analyzing the current state and characteristics of senior citizen center clients and developing a model related to the function of senior citizen centers.

### **1.3.2. Research study**

Survey questions were extracted through consulting with working-level persons with the support of the Seoul Metropolitan Support Center for Senior Citizen Centers in the Korean Senior Citizens Association's Seoul Federation, while their validity and reliability were verified through consultation meetings.

Because this operation condition study was aiming for a complete enumeration survey of senior citizen centers in Seoul, all possible candidates were encouraged to participate rather than sampling. Study subjects were persons in charge of senior citizen centers(presidents or center heads) considering the aim of this study.

### **1.3.3. Professional consultation**

The research was carried out by first forming a team of experts that participated in studying the current condition of senior citizen centers and developing a model for embracing the future elderly generation. Professional opinions were considered, and consultative meetings were organized to gather opinions before proceeding with the research. Professional opinion were generally concerning the causes of poor operation and vitalization of senior citizen centers, while various reactions of stakeholders in the senior citizen

business, support level, etc. were discussed in the consultative meetings.

#### **1.4. Research content**

The research model was constructed in order to propose improvements in operating senior citizen centers by re-establishing the operation method and functions of senior citizen centers as a solution, based on the operation condition study of senior citizen centers in Seoul.

Problems in senior citizen center operation and improvement factors were analyzed through study factors such as the number of users and facilities in a senior citizen center, budget operation conditions, and program operation conditions, which are factors for the operation condition study of senior citizen centers in Seoul, while suggesting a new senior citizen center model. The research flow was set in the direction of ultimately securing quality management in senior citizen centers.

The following are the details.

Firstly, the current situation is understood by conducting an operation condition study through objective indices that provide an objective insight into the current operation of senior citizen centers such as the average number of daily users, total floor space of the senior citizen center, support budget conditions, program operation, etc.

Secondly, measures to transform and improve the functions of senior citizen centers in order to encompass diverse future demands of the elderly in regards to leisure and welfare.

Thirdly, proposing a binary model for the senior citizen center system was the focus in order to vitalize senior citizen centers and re-establish their functions.

## **2. Theoretical Background**

### **2.1. Current conditions of senior citizen centers as leisure and welfare facilities for senior citizens**

#### **2.1.1. Summary of senior citizen centers**

With the amendment of the Welfare for the Aged Act in 1989, it began being operated as a legal institution alongside schools for the elderly as a leisure facility for senior citizens based on Article 20 of the Welfare for the Aged Act. Senior Citizen Centers naturally formed in the format of the 'reception room' from our nation's unique culture and remained an unofficial resting area for the elderly. It was then given an organizational system under Korean Senior Citizens Association when it was established.

Coming into the 1990s, standards for senior citizen center facilities and operational management was systemized, operational expenses were supported, and the number of senior citizen centers increased exponentially with the construction of the new town[3]. It has developed into the South Korean local community's very own foothold for elderly group culture and a leisure and welfare facility for senior citizens to become what it is today[4].

#### **2.1.2. Current conditions of the facility size of senior citizen centers**

According to Article 36, Clause 2 of the Welfare for the Aged Act, senior citizen centers is a leisure and welfare facility for senior citizens that is constructed to provide a place where the local elderly can autonomously form friendships, participate in hobby activities, operate common workshops, exchange information, and do other leisure activities. It is the most common social welfare facility among the independent facilities and is the most accessible, successfully performing its crucial role in leisure activities for the elderly. According to the Ministry of Health and Welfare, in January 2015, there are 65,665 leisure and welfare facilities for senior citizens and among them 63,960 are senior citizen centers, adding up to 97%. In the case of Seoul as shown in <Table 1>, there are 3,743 leisure and welfare facilities for senior citizens and among them 3,298(88%) are senior citizen centers[5].

**Table 1.** Overall table of leisure and welfare facilities for senior citizens in Seoul 2015.1. present[6].

(Unit: Number)

City, province	Elderly group over the age of 65 (based on registered citizens in 2014.12.31)	Total	Welfare center for senior citizens		Senior citizen center	School for the elderly
			Number of facilities	Number of employees		
Seoul	1,223,221	3,743	74	1,284	3,298	371

According to the Ministry of Health and Welfare’s reports on the current condition of welfare facilities for senior citizens, the percentage of senior citizen centers is very high. Although demand for such facilities is slowly increasing as society ages, the qualitative factors of operation such as service content are expected to be more influential than the scale and range of the facility. With population increase and longer average life expectancy, it is evident that securing space for improving life quality through increased demand in care for the elderly and various leisure activities is essential.

## 2.2. Current conditions of senior citizen centers in Seoul

According to the Seoul government, there are 3,369 senior citizen centers in Seoul (2016.12).

### 2.2.1. Current conditions of facilities

According to the Seoul Metropolitan Support Center for Senior Citizen Centers data (2016), facilities are generally established focused on private establishments and apartments, and are generally located on the ground floor. It was shown that floor space was generally 99 m<sup>2</sup> or smaller.

When observed in detail, in the case of senior citizen centers 70.2% were founded by private establishments and 29.8% were founded by district jurisdictions (including public institutions). In the case of those in the format of senior citizen centers, 61.5% were facilities within an apartment complex,

and 38.5% were elsewhere, including autonomously-established centers. 75.8% were located on the ground floor, 18.2% were on the second floor or higher, and 1.4% were below ground level. In the case of scale of floor

space, 52.0% smaller than 9 m<sup>2</sup> while 48.0% were bigger than 99 m<sup>2</sup>.

### 2.2.2. Current conditions of scale

According to the Seoul Metropolitan Support Center for Senior Citizen Centers data (2016), the overall number of senior citizen centers, daily users, and registered members have been on the rise for the last three years.

There were 3,255 senior citizen centers in 2013, 3,298 in 2014, 3,316 in 2015, and 3,369 in 2016, showing a steady increase.

The same goes for the number of daily users per year. The average number was 62,121 in 2013, 65,753 in 2014, and 66,324 in 2015, revealing that the number of senior citizen center users increased over time.

There were 126,923 registered members in 2014, 129,072 in 2015, and 164,977 in 2016, showing an increase as well.

However, when observing the numbers in 2013, it can be observed that the margin of increase in the number of senior citizen centers, daily users, registered members, etc. is decreasing over time.

### 2.2.3. Current conditions of budget

When observing the overall budget supply to Seoul and autonomous districts over the last three years, 18,490,183 thousand KRW was supplied in 2013, 16,751,172 thousand in 2014, and 18,093,229 thousand in 2015.

When observing the ratio in the detailed budget execution during the three years from 2013 until 2015, from the overall budget of 53,334,584 thousand KRW, 72.7%(38,774,120 thousand KRW) was executed. 12.1% went to heating, 5.6% to food and beverage, 5.2% to senior citizen center program vitalization, 2.8%

to cooling, and 1.6% to senior citizen center specialized programs; center operating expenses had the largest ratio among the various expenses. This ratio, however, has decreased from 73.8% in 2013 to 69.8% in 2015, and heating costs are showing similar declines. On the other hand, cooling, food and beverage, and senior citizen center program vitalization costs appeared to increase over time; the ratio of expenses going to specific purposes is increasing.

#### **2.2.4. Current conditions of population in Seoul and each autonomous district, and scale of senior citizen centers**

The following are the current conditions regarding the number of senior citizen centers for each administrative unit(“dong”) and the proportion of senior citizen population per senior citizen center.

Firstly, when inspecting at the level of administrative dong, the average number of senior citizen centers was 7.8, and the autonomous district that is closest to the average was Gangbuk-gu with 7.4. Nowon-gu had the biggest number of senior citizen centers with 12.7, while Jongno-gu had the smallest with 3.1.

Secondly, when considering people 65 years of age or more as those that are qualified to use senior citizen centers, an average of 383 people could use one senior citizen center. Seocho-gu was the closest to the approximate value at 382, while Gwanak-gu could have the most users at 602 people and Seongdong-gu the least at 253.

Thirdly, when inspecting people that are 75 years old or older who use senior citizen centers the most, an average of 140 people could use one senior citizen center. Songpa-gu was closest to the approximate value at 142 people, while Gwanak-gu could have the most users at 199 people and Seongdong-gu the least at 95.

### **2.3. Preceding research review**

#### **2.3.1. Research on the functions of senior citizen centers**

Although the initial function of senior citizen centers was providing a place for senior

citizens to promote friendship, as senior citizens’ demands diversified and economic status increased, their interest in hobby activities and health, as well as their desire to maintain good health, increased as well. Hence, an additional function of providing a place for leisure activities was created.

Recently, with senior citizen centers coming into the limelight as a community resource, various activities and volunteering activities in the local community are taking place for the purpose of interacting with the local community. Senior citizen centers’ functions are expanding furthermore into areas such as operating common workshops and exchanging diverse information in order to gain economic profit.

However, in reality, although senior citizen centers have the advantage of being ‘easily accessible to facilities’ for senior citizens, poor facilities and budget is causing lacking support manpower for senior citizen center operation. This is resulting in limitations in carrying out the added functions of senior citizen centers.

Recently, the baby boomer generation is entering a generation of people that use senior citizen centers, and senior citizen centers’ functions need to be inspected in order for it to play its role as a leisure and welfare center that satisfies the physical, mental, health, and economic demands of senior citizen clients. Furthermore, research is being conducted to reflect various factors and demands future senior citizen centers need to prepare for[7].

In the case of Seoul, it is adopting the differentiation according to floor space for the improvement of senior citizen centers. They are being categorized into three types according to the scale of floor space, and each type is given a specialized program. Small scale centers with less than 30 ‘pyeong’ plays a role of a reception room, while those bigger than 30 pyeong’s functions are expanded to carry out the role of an open senior citizen and welfare center. As such, senior citizen centers are attempting to transform their functions[8].

The Busan Social Welfare Development Institute(2013) departmentalized the functions of senior citizen centers into 3 types according to the age group of their user population: The simple leisure type, leisure and welfare type, and local participation type. The Seoul Institute(2005) categorized the function of senior citizen centers into three types according to their floor space scale through a demonstration model study of welfare centers for the elderly: Homecare welfare for the elderly, leisure and welfare, and leisure(reception room)[9].

### **3. Research Results of Current Conditions of Senior Citizen Centers**

#### **3.1. Research summary**

##### **3.1.1. Research scale**

3,316 senior citizen centers located in Seoul in April 2016 were selected as study subjects, and results of conducting a survey after complete enumeration resulted in a total of 3,246 survey results being collected. The final selection of survey results added up to 3,043, showing a 92% collection rate excluding the 20 senior citizen centers that are not part of the present statistics and 183 overlapping survey responses.

##### **3.1.2. Study subjects**

The subjects of this study were persons in charge of senior citizen centers(presidents or center heads).

The contents of this study can have an important effect on future senior citizen center operation, so the opinions of actual persons in charge of senior citizen centers were recognized to be an important variable.

##### **3.1.3. Research content**

The research content consists of a current condition inspection and strengthening of the functions of senior citizen centers. There were a total of 14 questions including 12 questions related to the current condition inspection.

#### **3.2. Research results**

##### **3.2.1. Scale of total floor space of senior citizen centers**

The most common total floor space scale among senior citizen centers were 21-30 pyeong at 28.6%, while 26.0% was 10-20 pyeong, 18.3% were 41 pyeong or more, 17.0% were 31-40 pyeong, and 10.1% were 10 pyeong or less.

##### **3.2.2. Number of registered members**

70.7% of senior citizen centers had 21-50 registered members, 14.7% had 51-100, 10.4% had less than 20, and 4.2% had 101 members or more.

##### **3.2.3. Number of average daily users**

64.2% of senior citizen centers had 20 average daily users or less, 20.9% had 21-30, 7.3% had 31-40, 3.3% had 41-50, and 4.3% had 51 daily users or more.

##### **3.2.4. Current operation conditions**

###### **3.2.4.1. Provision of personnel expenses on lunch helpers**

58.5% of senior citizen centers used 200,000 KRW or less as personnel expenses for lunch helpers, 23.9% used 300,000 KRW or more, 13.6% used 200,000-249,999 KRW, 4.0% used 250,000-299,999 KRW.

###### **3.2.4.2. Average monthly shortage of operating expenses in senior citizen centers**

46.2% of senior citizen centers had an average monthly shortage of operating expenses less than 200,000 KRW, 43.2% had 100,000 KRW or more, 6.1% had less than 300,000 KRW, and 4.5% had less than 400,000 KRW.

###### **3.2.4.3. Uses of operating expenses in senior citizen centers**

36.7% of operating expenses in senior citizen centers were being used for subsidiary food expenses, 32.8% used for utilities, 17.4% used for eating, 8.7% used for shortages in heating and cooling, 1.7% used for benefits for executive employees, and 2.7% used for other spending.

### 3.2.4.4. Means to meet shortages in operating expenses in senior citizen centers

As means to meet shortages in operating expenses in senior citizen centers, 54.6% was membership fees, 41.0% was support funds from the local government, and 4.4% was support from the local representative or came from other profit sources.

### 3.2.4.5. Average monthly operating expenses that comes as support from Seoul or autonomous district

41.3% of senior citizen centers received 300,000-400,000 KRW as support funds from Seoul or autonomous district, 22.4% received 400,000 KRW-499,999 KRW, 18.4% received 200,000-299,999 KRW, 5.7% received 500,000-599,999 KRW, 5.4% received 200,000 KRW or less, 5.2% received 600,000-699,999 KRW, and 1.6% received 700,000 KRW or more.

### 3.2.5. Current conditions of programs

#### 3.2.5.1. Program satisfaction level

Regarding the satisfaction level of programs provided by senior citizen centers, 67% were very satisfied or satisfied while 3.9% were unsatisfied or very unsatisfied, revealing that there is a high satisfaction level in the programs that are being provided currently.

#### 3.2.5.2. Detailed program satisfaction level

Among the various detailed programs, 69.2% were very satisfied or satisfied in the dementia prevention and examination program, 68.1% were very satisfied or satisfied in the healthy walking program, and 70.6% were very satisfied or satisfied in the healing city farming program.

### 3.2.6. Satisfaction level and difficulties in senior citizen center use

Regarding difficulties in using senior citizen centers, the satisfaction ratio was 92% and dissatisfaction ratio was 8%, revealing that users were generally satisfied. However, among the things that need improvement, the number one factor was operation problems(including membership fees), second was facility and equipment problems, and third was member relationship problems(conflict resolution and bonding issues). In the aggregated results that did not consider rankings, facility and equipment problems were the most common, while operation problems(including membership fees) and member relationship problems (conflict resolution and bonding issues) also showed to be problematic factors that needed improvement.

## 4. Strengthening Senior Citizen Center Functions and a New Model

### 4.1. Senior citizen center operation types and direction of function improvement

#### 4.1.1. Research results of operation types and functions of senior citizen centers

##### 4.1.1.1. Senior citizen center operation type

As shown in <Table 2>, in the case of operation type 78.5% preferred the current system of distinguishing between welfare centers and senior citizen centers. Meanwhile, 9.5% preferred the small-scale welfare center type, 6.0% preferred senior citizen centers distinguishing age groups, and 5.9% preferred open senior citizen centers that operate programs per topic according to user preference.

**Table 2.** Satisfaction level according to the operation type of senior citizen center[10].

Satisfaction level according to the operation type	Frequency	%
Distinguishing between welfare centers and senior citizen centers	2,390	78.5

Distinguishing between a reception room-type, open-type, or small-scale type of welfare center according to scale	288	9.5
Expanding to an open senior citizen center(cafeteria, hobby, etc.) and changing the operation type according to senior citizen preference	181	5.9
Distinguishing age groups and operating autonomously as similar age groups gather	184	6.0
Total	3,043	100

#### 4.1.1.2. Future functions of senior citizen centers

As shown in <Table 3>, regarding the future function of senior citizen centers, based on the current preference level that strongly leans towards the current format of distinguishing between welfare centers and senior centers, 35.5% is a resting area for senior citizens(reception room) while 31.9% provide leisure programs, resulting in 67.4% being the combination of the two functions. On the other hand, 13.2% consisted of economic

support(common workshops), 9.5% was volunteering for the local community, 6.4% was caring for the elderly(volunteering to help senior citizens), and 3.5% was educating and training for social readjustment, which are new functions demanded by the baby boomer generation and new functions society needs. Thus, it was evident that among presidents or center heads of senior citizen centers, there was a high preference in the current operating type of senior citizen centers.

**Table 3.** Future functions of senior citizen center[11].

Future functions of senior citizen centers	Frequency	%
Resting area for senior citizens(reception room)	2,793	35.5
Providing leisure programs	2,508	31.9
Economic support(common workshops)	1,040	13.2
Volunteering in the local community(volunteering)	749	9.5
Volunteering for the elderly	507	6.4
Educating and training for social readjustment	279	3.5
Total	3,043	100.0

## 4.2. Operation types and re-establishment of functions of senior citizen centers

### 4.2.1. Existing formats

The senior citizen center model that society realistically demands is something that overcomes the passive, inner-directed type of

closed off senior citizen center with the function of a reception room and rather an open senior citizen center that interacts with the local community and promotes new jobs and volunteering, with an expanded range of functions.

In particular, when the baby boomer generation begins using senior citizen centers in the future, the existing reception room and leisure-focused function of senior citizen centers is expected to be insufficient considering that generation's characteristics and demands[12].

However, persons in charge of senior citizen centers prefer the existing operating type that has the function of reception rooms or resting areas for the elderly, and prefers the current status quo of distinguishing welfare centers and senior citizen centers. This makes it realistically difficult to find the internal impetus to transform senior citizen centers' functions, making it evident that effort is essential to do so.

In order to improve and transform the operation and functions of senior citizen centers,

the support and cooperation of senior citizens that use the facilities is essential, but these problems are difficult to solve with mere cooperation, and institutional methods will be needed as well.

In the case of Seoul, as shown in <Table 4>, the operating functions of senior citizen centers is being distinguished by encouraging simple rest and friendship promotion in centers with a floor space of 99 m<sup>2</sup> or less, an open center-function for those with a floor space of 100-299 m<sup>2</sup>, and welfare center functions for those with 300 m<sup>2</sup> or more. By distinguishing functions according to floor space and operating various programs and activities, it can be understood that diverse demands are being accommodated.

**Table 4.** Operating models of senior citizen centers in Seoul[13].

Category	Less than 20m <sup>2</sup>	20-49m <sup>2</sup>	50-99m <sup>2</sup>	100-299m <sup>2</sup>	300m <sup>2</sup> or more
3,346 centers	13(0.4%)	530(16%)	1,271(38%)	1,442(43%)	90(2.6%)
Function	Space for simple rest and friendship formation			Open senior citizen center	Implementation of welfare center functions

#### 4.2.2. Operating formats and functions of senior citizen centers

When studying existing study results and case examples, it is observable that factors such as the characteristics of senior citizen center users, center facilities and floor space, number of registered members and average daily users affect the operation type and function of senior citizen centers. In this study, centers were distinguished between reception room-types and open-types based on this.

Firstly, 99 m<sup>2</sup> of floor space is set as the distinguishing standard, those with 99 m<sup>2</sup> or less floor space is often operated inefficiently because there is not enough space for operating programs provided by the local commu-

nity(including the Korean Senior Citizens Association), so it is evaluated that it is more effective for them to carry out their existing reception room function. When the floor space is 100 m<sup>2</sup> or more, there is sufficient facilities and equipment to carry out the functions of interacting with the local community and participating in creating jobs, etc. making it possible for them to operate various programs and businesses.

Secondly, when centers are distinguished according to whether they have 29 registered members or less and 20 or less average daily users, the number of senior citizen centers with a large floor space but few users that are criticized for inefficient operation can be decreased. On the other hand, the more registered members and average daily users a sen-

ior citizen center has, the higher the possibility that hit will operate diverse programs and secure efficiency in budget execution.

Therefore, reception room-type senior citizen centers with a floor space of 99 m<sup>2</sup> or less can operate leisure programs for a small number of people and comparatively older citizens can be encouraged to use them. On

the other hand, if the floor space is 100 m<sup>2</sup> or more, senior citizen centers can be encouraged to interact with the local community and participate in businesses that create jobs so that they can be switched over to facilities that the baby boomer generation can mainly use in the future. Such a binary operation method is summarized in <Table 5>.

**Table5.** Operation model according to type of senior citizen center[6].

Category	Type of senior citizen center	
	Open-type	Reception room-type
Scale	100m <sup>2</sup> or more	99m <sup>2</sup> or less
Number of registered members	30 or more	29 or less
Main Age Group	Mainly 60s and 70s	Mainly 80s or older
Number of Users(per day)	21 or more	20 or less
Function	Business-focused such as interaction with the local government, participating in jobs	Focused on leisure and health

## 5. Conclusion and Policy Proposal

The purpose of this research is to improve senior citizen center welfare that is at risk. Senior citizen centers in South Korea have a history that includes palaces, gazebos, reception rooms, and community centers. However, younger senior citizens 75 years old or younger currently consider senior citizen centers to be old-fashioned and are reluctant to use them. The current average user age is 78.

There are approximately 65,000 senior citizen centers nationwide, with 3,369 in Seoul and 7 or 8 in each administrative dong. It is the senior leisure and welfare society that is the most accessible in the world, and because it is a user-focused democratic establishment that is autonomously managed and operated by the users, it is a very low-cost high-efficiency system with an expense of 10 million KRW or less per year.

However, the truth is that the current conditions are inappropriate to carry out pro-

grams and leisure and welfare functions because 52% of all senior citizen centers have a floor space of 99 m<sup>2</sup> or less, 44.8% a floor space of 100-299 m<sup>2</sup>, and only 3.2% have a space of 300 m<sup>2</sup> or more. Due to such limitations in the facilities, most senior citizen centers have the function of providing a reception room-type space where people can share their life stories. It is therefore evident that a new model of senior citizen centers with active functions similar to senior centers in the United States is urgently needed, providing leisure and welfare to comparatively younger senior citizens. It can be observed that a binary system of both reception room-focused senior citizen centers and US senior center-type senior citizen centers is needed to become a home for senior citizens' welfare and leisure. Managing service quality is urgently needed such as providing a tailored high-quality program, complimentary food, and systematic healthcare through the development a new model of senior citizen centers.

## 6. References

### 6.1. Journal articles

- [3] Moon YK & Koh KS & Kim HK. Study on Improving the Operation of Senior Citizen Centers Seoul Metropolitan Federation of Korean Senior Citizens Association. *Report on Senior Citizen Center Operation of Function Improvement*, 1, 8-10 (2016).
- [5] Ryu YS & Kim AM. Development of the Seoul Social Welfare Center Evaluation Index. *Journal of Seoul Welfare Foundation*, 1, 35-40 (2006).
- [8] Oh YH & Jeong KH & Lee YK. Study on the Reality of Senior Citizen Centers and Support Means. *Journal of Korea Institute for Health and Social Affairs*, 1, 21-30 (2004).
- [9] Lee GH & Lee HY. Case Study on Ways to Vitalize Senior Citizen Center Operation: Focused on Persons Affiliated to Gyeonggi-do Senior Welfare Centers. *Study on Senior Citizen Welfare*, 54, 165-192 (2011).
- [12] Im CS & Kim KH & Kim MS & Lee KH & Lee IS. Study on the Current Conditions of Senior Citizen Centers in Seoul and Improvement Methods. *Journal of Seoul Welfare Foundation*, 31, 9-25 (2006).

### 6.2. Thesis degrees

- [2] Koh KS. The Effects of Senior Citizens Satisfaction Level in Senior Citizen Centers on their Satisfaction in Life. Dongbang Culture University, Doctoral Thesis (2017).

### 6.3. Conference proceedings

- [7] Park KD. Study on Social Welfare Policies Evaluation Index System Composition and a Case Study. 2001 Winter Academic Conference of Korea Association for Public Administration (2001).

### 6.4. Additional references

- [1] <http://www.donga.com/> (2017).
- [4] Kim KH & Yoon MS & Jin SM. Study on Senior Citizen Center Program Monitoring and Improvement Methods (2012).
- [6] Seoul Metropolitan Support Center for Senior Citizen Centers. Overall Table of Leisure and Welfare Facilities for Senior Citizens in Seoul (2015).

- [10] Seoul Metropolitan Support Center for Senior Citizen Centers. Survey on the Satisfaction Level according the Operation Type of Senior Citizen Centers (2017).
- [11] Seoul Metropolitan Support Center for Senior Citizen Centers Survey on The Future Functions of Senior Citizen Centers (2017).
- [13] Seoul Government. Operating Models of Senior Citizen Centers in Seoul (2016).

#### Lead Author

**Kang Eun-mi** / Seoul Metropolitan Support Center for Senior Citizen Centers Chief Officer

B.A. Sungkyunkwan University

M.A. Sungkyunkwan University

Ph.D. Dongbang Culture University

#### Research field

- Study on the Dangcho Pattern, Sungkyunkwan University, Master's Thesis (1988).

- Study on Improving the Function of Senior Citizen Centers at Risk in Korea, *International Journal of Crisis & Safety*, 2(4) (2017).

#### Major career

- 1994~2006. Hankyoreh News, Reporter

- 2014~present. Seoul Metropolitan Support Center for Senior Citizen Centers, Chief Officer

#### Corresponding Author

**Lee Young-chul** / Dongbang Culture University Professor

B.A. Korea University

M.A. Korea University

Ph.D. Peking University

#### Research field

- The Study on the Epigraph and Calligraphy of the Paekche, *Institute for Eastern Classic Studies*, 19 (2010).

- The Consideration of Koguryo's Culture and Art of Great King 'Gwang Gae To's Epitaph, *Kukhak Institute*, 12 (2012).

#### Major career

- 2015~present. Korea Calligraphy Academy, Vice President

- 2011~present. Korea Stately Mansion Academy, Director

Publication state: Japan  
ISSN: 2189-7603

Publisher: J-INSTITUTE  
Website: <http://www.j-institute.jp>

Corresponding author  
E-mail: [ylee@gachon.ac.kr](mailto:ylee@gachon.ac.kr)

Peer reviewer  
E-mail: [editor@j-institute.jp](mailto:editor@j-institute.jp)

<http://dx.doi.org/10.22471/crisis.2017.2.4.12>

© 2017 J-INSTITUTE

## A Virtual Study on the EMERGENCY MEDICAL Facility in Disaster Site

Yoon You-sang<sup>1</sup>

*PMPGM Inc., Seoul, Republic of Korea*

Lee Young<sup>2\*</sup>

*Gachon University, Seongnam, Republic of Korea*

Suh Sang-wook<sup>3</sup>

*Gachon University, Seongnam, Republic of Korea*

### Abstract

Recently, as interest in disaster-safety has been rising, contents regarding disaster medical service have been presented in various related guidelines. However, the presentation of criteria related to the facility input has been insufficient. In the case of contents regarding site selecting methods related to field emergency medical facility input, the criteria and procedures necessary for decision making have not been systematically organized. In this study, as a basic study related to field emergency medical facility input site selection among matters requiring decision making related to disaster field emergency medical facility input, factors that must be considered necessary for site selection and the process were derived. In addition, the field emergency medical facility input site selecting process was actually presented based on a virtual site. In the future, quantitative criteria for disaster field emergency medical facility input should be presented according to diverse disaster types.

**[Keywords]** Emergency Medical Facility, Disaster, Virtual Development, Site Selection, Criteria

## 1. Introduction

### 1.1. Background and purpose of the study

In cases where a large number of patients occurred in a disaster site, the three-stage medical system such as severity classification, first aid treatment and transportation should be operated. However, problems such as patient transportation without considering capacity of the disaster base hospital and delayed input of facilities and equipment for emergency rescue patients are occurring. Despite that rapid medical treatment should be conducted for the victims transported to the field emergency medical facility in the event of a disaster, cases where large damage for humans is brought about due to the lack of facilities for the input of the medical personnel are occurring.

Although some studies have been carried out regarding the selection of the location of

the medical facility[1][2][3], studies that considered disaster situations are quite insufficient and various guidelines related to disaster management do not present concrete criteria in relation to field emergency medical facility input. In the case of South Korea, the installation standards for facilities for emergency medical service at disaster sites are ambiguous and difficulties are experienced in communication with the field commander during the installation process[4]. Therefore, relevant systematic input methods should be presented.

Therefore, this study aims to present a field emergency medical facility site selection process to support rapid decision making in relation to field emergency medical facility input in the event of a disaster.

### 1.2. Scope and method of the study

In this study, site selection criteria were presented considering the installation of a

new facility among the field emergency medical facility input methods, and the criteria for field emergency medical facility input were presented referring to the shelter designation criteria in the case of occurrence of a disaster because there is no separate guideline. The detailed method of this study is as follows.

First, to consider disaster medical service response systems, the present situation of disaster field emergency medical facility input, and the safety of the injured and emergency medical service personnel in field emergency medical facility site selection, existing shelter selection criteria are identified.

Second, considering the shelter selection criteria, location selection items for field emergency medical facility site selection are derived.

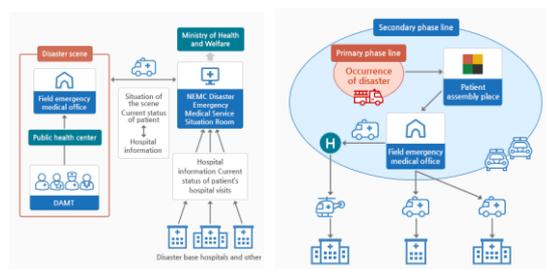
Third, the decision making process for selection of field emergency medical facility location and a field emergency medical facility site selecting assuming the occurrence of an actual disaster are presented.

## 2. Disaster Medical Service Related Present Situation

### 2.1. Disaster medical service response system

Laws regarding disaster medical service include the Framework Act on the Management of Disasters and Safety, the Emergency Medical Service Act, and Rules Regarding Emergency Relief Response Activities and Site Command. The Rules Regarding Emergency Relief Response Activities and Site Command are intended to unify dispersed regulations regarding medical aid when a disaster has occurred and the disaster emergency medical service response manual includes contents regarding the roles of individual institutions related to emergency medical service aid at disaster site at the national level and at the local government level, information on command systems, and emergency medical service systems at disaster sites.

**Figure 1.** Disaster response report system in the event of a disaster[5].



As shown in <Figure 1> above, the disaster emergency medical service response manual indicates the roles of individual organization in the event of a disaster. The Ministry of Health and Welfare is in charge of general management in relation to disaster medical service support and the Central Emergency Medical Service Center is in charge of the determination of the initial response level, the operation of disaster emergency medical service situation room, and support of disaster medical service supplies. With regard to the DMAT dispatch, the manual specifies that the Central Emergency Medical Service Center shall determine the dispatch of the central DMAT while individual city and do government shall determine the dispatch of local DMATs.

The disaster emergency medical service response manual stipulates that the site emergency medical service implementation place should be selected through discussion with the site command post or should be determined as instructed by the head of the health center in cases where the emergency relief control group has not yet been organized. As for the method of installation of the site emergency medical facility, the manual specifies that an existing building should be used if possible, should install tents if no building is available, and outdoor activities should be conducted if tents cannot be installed. The manual also specifies that if there is a medical institution in the vicinity of the disaster site and the access and gathering of patients and ambulances are easy, the medical institution may be utilized as a site emergency medical facility.

### 2.2. Present situation of field emergency medical facility

The field emergency medical facility operation scale is determined based on the number of casualties. When the operating organization has been maximally expanded, it consists of a severity classifying team, a first aid team, a transportation team, a medical resource support team, and a temporary mortuary. After the Sewol ferry accident, the functions of regional emergency medical service centers were reinforced and Disaster Medical Assistance Teams have been operated.

Currently, in the event of a disaster, medical air tents are mainly used as site emergency medical facilities such as selective clinics and negative pressure tents. Medical air tents can be also used as an interim command center, temporary hospitals, refugee concentration camps, or temporary barracks, and are actually operated by the Korea Disaster Relief Team(KDRT) in situations where overseas medical support is necessary. The KDRT has been trained on the installation and operation of mobile hospitals and has deployed mobile hospitals in the form of tents. KDRT's mobile hospitals are divided into three categories: Basic Health Care center, Rapid deployment emergency hospital, Referral hospital, which are divided into 13 modules including administration, technology, Lab & Pharmacy, outpatient, medical device, medical consumables, and medicines[6]. <Figure 2> below shows photograph data on mobile hospital installation and operation training.

**Figure 2.** Views of mobile hospital installation and operation training[7].



### 2.3. Shelter designation criteria

In the initial stage after occurrence of a disaster, human life rescue activities should be conducted and safety should be ensured to prevent secondary damage. Victims become to reside in emergency shelters such as

schools, town halls, and government offices until temporary residential facilities for victims are prepared[8]. Site emergency medical facilities should also have evacuation functions to ensure the safety of patients occurred and emergency medical services workers.

In the case of the United States, the American Red Cross's standards for hurricane evacuation shelter selection states that the medical service area should be 40ft<sup>2</sup> per resident. The guidelines present the identification of areas that can be selected with the standards for hurricane evacuation shelter selection, consideration of matters related to measures for evacuation and means of transportation, and completion of evaluation of possible areas. In addition, the Evacuee Support Planning Guide of the Federal Emergency Management Agency also specifies shelter support for medical and health care. In the case of Japan, the Guidelines for the Management and Operation of Shelters were revised based on the Basic Law for Disaster Preparedness in 2013, and the operating standards and methods of shelters are presented. According to the shelter and secondary shelter designation criteria set out in the Guidelines for the Management and Operation of Shelters, in the case of shelters, public buildings(schools, etc.) equipped with earthquake proofing, fire-proofing, and reinforced concrete structures should be used. The number of victims accommodated in shelters is limited to two persons per 3.3 m<sup>2</sup> of the living room. In the case of the secondary shelters, the guidelines suggest to conclude preliminary agreements with related institutions(medical institutions, etc.) in order to secure facilities. In the case of Australia, 43 disaster-related manuals were prepared to be prepared for emergencies. The manuals present matters to be considered when rescue service center locations are selected such as accommodation capacity, electric power, sewage, water, telecommunications, long-term availability, medical care (possibility to provide medical service), access roads, means of transportation accessibility, and parking lots.

In the case of South Korea, shelter designation standards have been established as part

of the disaster relief plan in the event of a disaster based on Article 4-2 of the 「Disaster Relief Act」. According to the foregoing, information on the evacuation site that must be investigated includes general information such as name, address, telephone number, and manager and available space, capacity, evacuation route and distance. The location of the evacuation site should be designated and installed within 1km as the walking distance. The subjects of designation as places for evacuation first are public facilities such as elementary schools, middle schools, and si/gun/gu village halls and churches.

### 3. Factors That must be Considered for Site Selection

The disaster emergency medical service response manual presents requirements for places for field emergency medical facility installation as follows; 1) the tent area and appropriate area necessary for installation should be secured, 2) medical staff safety should be ensured, 3) place where the ambulance traffic line and the patient moving line intersect with each other, 4) places with good drainage, 5) places where winds blow from the back (in the case of fire and chemical disaster), and 6) places close to electrical and water facilities[9].

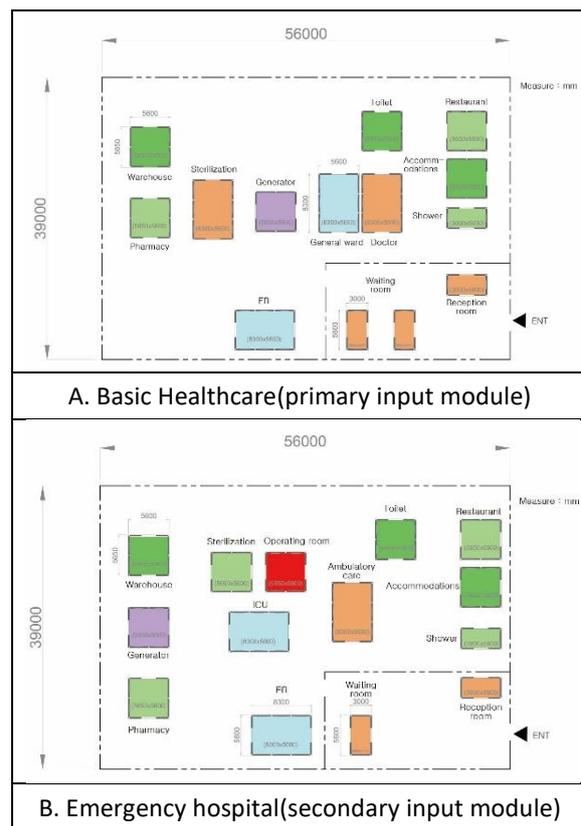
According to the above requirements, item 1) is related to the area. The area of the field emergency medical facility is determined based on the number of persons that must be rescued and the medical staff input scale. Since the number of the injured may increase or decrease over time, in this study, the input scale of medical staff(DMAT) was selected as a criterion for areas. Item 2) is a matter related to safety and the area of the field emergency medical facility module and the facility to secure spaces were selected as criteria for selection of the site referring to the shelter designation criteria. In the case of item 3), the distance between the disaster occurrence site and the disaster base hospital and the road width on the route were selected as site selection criteria, taking into account the ambulance movement route and the travel time between the disaster occurrence site and the

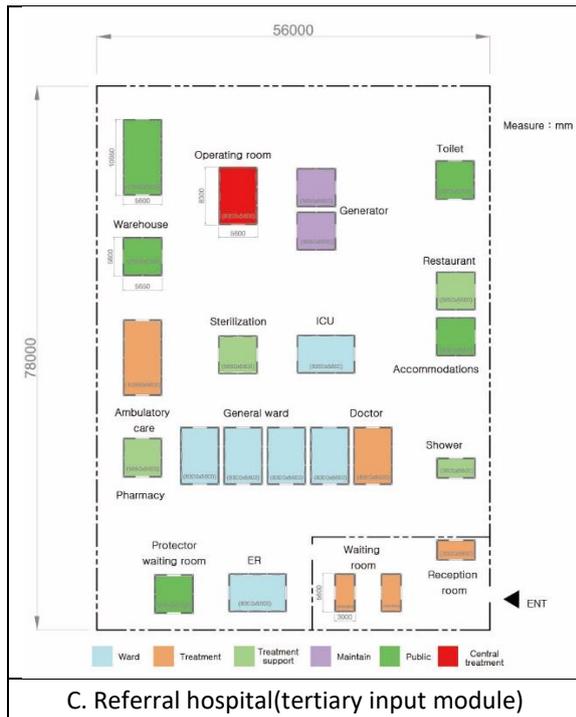
disaster base hospital. Items 4), 5) and 6) were excluded from the site selection criteria, as these are matters for which the time of occurrence of the disaster and climates should be considered. In addition, under the judgment that the demand for emergency medical services in the disaster site is proportional to the population density, population density was selected as a site selection criterion.

#### 3.1. DMAT input scale

This study presented a plan to prepare facilities and equipment for DMAT input from the time when a request from a disaster site occurred to install the facilities and equipment at the disaster site, construct facilities necessary for DMAT 1 team, and input additional facilities when necessary.

Figure 3. KDRT filed hospital layout conceptual diagram[8].





The above Figure shows the types of field emergency medical facility modules organized by these researchers through comparison with site hospitals of Finnish Red Cross that show the most similar forms referring to the layout image of KDRT Field Hospital. The field emergency medical facility modules divided into three types(A-Basic Health Care Module, B-Rapid Deployment Emergency Hospital Module, and C-Referral Hospital Module) are presented. The A-B-C modules have the functional configurations necessary for severity classification, patient treatment, and patient transportation, respectively, and the sizes of sites by function are approximately 39M × 56M, 39M × 56M, and 78M × 56M, respectively.

### 3.2. Safety space

In this study, public facilities are first considered as the field emergency medical facility site considering the shelter designation standard. In order to designate a shelter site, site selection should be made considering information on the public facility area and surrounding building information. Since the method of applying the shelter-designation standards may be different depending on

whether the disaster occurrence area is an urban area or not, information on public facilities equipped with a playground and a gym should be linked for management. Among the shelter-designation standards, there is a requirement to designate a shelter through discussion with the building owner or manager. However, since there is no time to select a field emergency medical facility site through a separate consultation process in the event of the occurrence of a disaster, utilizing shelter spaces designated through prior discussion with building owners or managers is desirable. In cases where spaces that meet the shelter-designation standards do not meet the field emergency medical facility standards such as the distance to transport patients, the primary input module space that enables severity classification should be first selected and spaces should be secured considering future expansion in parallel. In addition, the contents related to electricity and water among the field emergency medical facility standard currently presented based on tents should be applied to space arrangement in cases where unit modules are installed utilizing using utility modules(management modules).

### 3.3. Distance to the disaster base hospital

The distance standards for the field emergency medical facility site selection were presented separately for distances to the disaster base hospital and distances from the disaster occurrence point. The distances to the disaster base hospital are the most commonly used method in the current disaster management method, and in the case of the distances from the disaster occurrence point, different standards are presented according to the disaster types. For example, in cases where the ground is unstable, such as an earthquake, a field emergency medical facility should be constructed outside of a certain range, and if it is inevitable to limit the movement of injured persons such as infections, a field emergency medical facility should be constructed within a certain range.

### 3.4. Road widths by route

Road widths should be determined considering the number of the sides of the candidate field emergency medical facility site in contact with roads and the kinds of roads is determined based on the mobility of the facility and the patient, depending on the type of road in contact. Road widths should be considered in linkage with routes to the disaster base hospital reflecting the means of transportation for patient transfer. Since movements between the field emergency medical facility the disaster base hospital are expected to be frequent, road widths by route should be identified. This is to predict travel times by route between the field emergency medical facility and the disaster base hospital.

### 3.5. Candidate site population density

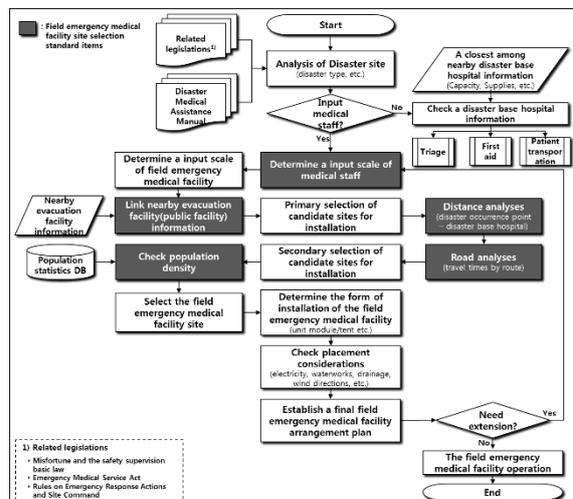
The population density of the candidate site for the field emergency medical facility is a standard for prediction of the number of the injured in proportion to the population density of the disaster occurrence site. A method to consider areas with high population density first when selecting a field emergency medical facility site is presented. This is not considered in cases where candidate sites are in the same area(the same area based on the standard for population density statistics) because the population densities are the same.

## 4. Virtual Development of Site Selection

The decision making process related to the site selection for the field emergency medical facility is shown in <Figure 4>. The site selection process for the field emergency medical facility consists of three steps and the final arrangement plan is finalized thereafter considering the form of installation and placement considerations.

In this study, a site for emergency medical facility construction was selected based on the assumption of an earthquake occurrence near Gachon University, Seongnam city, Gyeonggi-do.

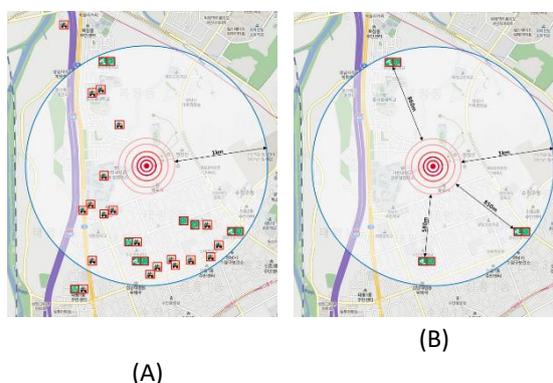
**Figure 4.** Field emergency medical facility input decision making process.



### 4.1. Primary selection of candidate sites for installation

First, assuming a region within a radius of 300m as a disaster area, temporary residential facilities for victims, outdoor earthquake shelters, indoor earthquake medical relief stations, indoor shelters, and civil defense evacuation facilities located within 1km, which is a shelter selection criterion, were checked and through the results, evacuation facilities existing as shown in <Figure 5>(A) below could be identified. Among them, three elementary school facilities equipped with an outdoor playground where a field emergency medical facility can be installed were selected(see <Figure 5> (B)).

**Figure 5.** Shelters near an area of earthquake damage.



As shown in the picture above, the three elementary schools show distances of 860m (Bokjeong Elementary School), 850m(Seong-

nam Elementary School), and 580m(Sujin Elementary School), respectively from the disaster point.

Although Sujin Elementary School is the most suitable based on general shelter selection criteria, the site should be selected considering the distance to the disaster base hospital for patient transportation.

#### 4.2. Secondary selection of candidate sites for installation

In cases where multiple candidate sites were derived through primary selection, the travel times between the disaster site and the disaster base hospital by route should be identified through distance and road analyses. The following table shows a summary of travel distances between the three elementary schools(Sujin, Seongnam, Bokjeong elementary schools) and nearby disaster base hospitals, which were identified based on 12:00 on weekdays, and the present situations of surrounding roads of individual elementary schools.

**Table 1.** Distance information of candidate sites for field emergency medical facility installation(Based on 12:00 weekdays, shortest distances).

Hospital name	Sujin elementary school		Seongnam elementary school		Bokjeong elementary school	
	Km	Min	Km	Min	Km	Min
Seoul national university hospital	22.0	84	22.3	83	19.8	79
Korea university medical center (Anam hospital)	20.7	72	20.9	69	18.4	65
Seoul medical center, Seoul	21.3	69	21.5	67	19.0	62
Hanyang university medical center	17.1	57	17.4	56	14.9	51
Ajou university hospital	22.4	56	23.2	57	24.3	58
Hallym university. Sungsim hospital,	20.7	29	21.5	30	22.6	31
Seoul national university Bundang hospital,	12.2	30	13.0	31	14.1	33
Bundang CHA medical center,	4.5	16	5.3	17	6.4	18
Wide main road 25m or wider medium road 12~25m, Small road 8~12m minute road 8m	Site in contact with small road		Site in contact with wide main road and minute road		Site in contact with medium road	

As shown in the above table, Sujin Elementary School is 4.5km away from Bundang Cha Medical Center, which is the closest among

nearby disaster base hospitals, and a travel time of 16 minutes is required on the bases of 12:00 on weekdays considering the road width(site in contact with small roads). Therefore, selecting Sujin Elementary School as a field emergency medical facility installation site can be regarded to be valid as patients can be transported the most swiftly.

#### 4.3. Field emergency medical facility site selection

In cases where multiple candidate sites have been selected, selecting the site for the field emergency medical facility through population density is desirable. However, population density was not considered in this study since the cases in this study have the same population density. When a site for the field emergency medical facility has been the form of installation of the field emergency medical facility should be determined(utilization of an existing building, unit module, tent, etc.) and a final field emergency medical facility arrangement plan is established considering electricity, drainage, and wind directions. When a field emergency medical facility should be expanded, the scale of additionally input should be considered and when the site should be changed or additionally secured when the facility is expanded, the existing candidate sites(Bokjeong Elementary School, Seongnam Elementary School) should be considered first.

### 5. Conclusion

Although the input of emergency medical service should be determined very quickly at the disaster site, standards in relation to facilities that must be input together with medical service workers have not been systematically prepared. In the case of site selection for field emergency medical facilities, only ambiguous criteria that the area and safety should be secured have been presented. Therefore, the criteria should be improved.

In this study, site selection criteria items related to field emergency medical facility input were derived, a site selection process was presented based on the foregoing, and virtual

development of site selection was performed. Major study results are as follows.

First, the status of disaster site emergency medical facilities was analyzed for site selection related to field emergency medical facility input in the event of a disaster and shelter designation standards were analyzed to secure safe sites. According to the results, the use of public facilities was considered first in most cases.

Second, field emergency medical facility site selection standard items derived in this study include the scale of medical staff input for determination of the facility area, space information for safe facility input (nearby public facility information - evacuation facility information), distances for smooth medical staff input and patient transportation (Distance between the disaster occurrence point and the disaster base hospital), and road widths by route (road widths by route between the disaster occurrence point and the disaster base hospital). In addition, population density was included under the assumption that the number of the injured during disasters is proportional to population density.

Third, this study presented processes to select primary candidate sites considering medical work input scales and spaces, select secondary candidate sites considering travel times between the disaster occurrence point and the disaster base hospital, select the final site considering population density, and select the disaster emergency medical facility site considering future expansion.

## 6. References

### 6.1. Journal articles

- [1] A Soltani & EZ Marandi. Hospital Site Selection Using Two-stage Fuzzy Multi-criteria Decision Making Process. *Journal of Urban and Environmental Engineering*, 5(1), 32-43 (2011).
- [2] N Sharmin & MN Neema. A GIS-based Multi-criteria Analysis to Site Appropriate Locations of Hospitals in Dhaka City. *Asian Transactions on Engineering*, 3(4), 8-12 (2013).

- [3] RZ Farahani & M SteadieSeifi & N Asgari. Multiple Criteria Facility Location Problems: A Survey. *Applied Mathematical Modelling*, 34(7), 1689-1709 (2010).
- [4] Cha MI & Kim GW & Kim CH & Choa MH & Choi DH & Kim IB & Wang SJ & Yoo IS & Woon HD & Lee KH & Cho SJ & Heo T & Hong ES. A Study on the Disaster Medical Response during the Mauna Ocean Resort Gymnasium Collapse. *Journal of the Korean Society of Emergency Medicine*, 28(1), 97-108 (2017).

### 6.2. Conference proceedings

- [8] Kim MK & Choi SM & Choi YR. Comparative Study on the Planning Guide of Emergency Shelter after Disaster between South Korea and the United States. Korean Institute of Interior Design 2016 Spring Conference (2016).

### 6.3. Additional references

- [5] <http://www.e-gen.or.kr/> (2017).
- [6] Emergency Medicine Research Foundation. A Research Report on Introduction and Effective Operation of Domestic Mobile Hospital (2016).
- [7] <http://www.koica.go.kr/> (2013).
- [9] Ministry of Health-Welfare & National Emergency Medical Center. Disaster Medical Assistance Manual (2016).

**Lead Author**

**Yoon You-sang** / PMPGM Inc Director of Research Center  
B.A. Kyungwon University  
M.A. Kyungwon University  
Ph.D. Kyungwon University

## Research field

- Decision-making Support Systems Using Case-based Reasoning for Construction Project Delivery Method Selection: Focused on the Road Construction Projects in Korea, The Open Civil Engineering Journal, 10 (2016).
- Estimation and Adjustment Model Considering Time Value of Money for Long-term Maintenance Cost of Apartment House, Korea Journal of Construction Engineering and Management, 18(3) (2017).

## Major career

- 2010~2014. University of Seoul, Lecturer
- 2014~present. PMPGM Inc., Director of Research Center

**Corresponding Author**

**Lee Young** / Gachon University Professor  
B.A. Seoul National University  
M.A. University of Virginia  
Ph.D. Seoul National University

## Research field

- A Study on the Block Unit Architectural Plan for Taepyeongdong Housing Regeneration-focused on the Original Part of Seongnam City, International Journal of Applied Engineering Research, 18(10) (2015).
- An Analysis of the Spatial Organization of Gangnam Bogumjari A3BL Complex, International Journal of Applied Engineering Research, 2(11) (2016).

## Major career

- 1986~present. Gachon University, Professor
- 2017~present. Special Construction Technology Deliberation Committee, Member

**Co-Author**

**Suh Sang-wook** / Gachon University Professor  
B.A. Seoul National University  
M.A. Seoul National University  
Ph.D. Seoul National University

## Research field

- Spatial Factors Affecting the Loading Efficiency of Excavators, Automation in Construction, 48 (2014).
- The Attribute Impact Concept: Applications in Case-based Reasoning and Parametric Cost Estimation, Automation in Construction, 43 (2014).

## Major career

- 1993~present. Gachon University, Professor
- 2016~2017. Public Procurement Service, Proposal Evaluation Committee

Publication state: Japan  
ISSN: 2189-7603

Publisher: J-INSTITUTE  
Website: <http://www.j-institute.jp>

Corresponding author  
E-mail: [kdw1533@naver.com](mailto:kdw1533@naver.com)

Peer reviewer  
E-mail: [editor@j-institute.jp](mailto:editor@j-institute.jp)

<http://dx.doi.org/10.22471/crisis.2017.2.4.21>

© 2017 J-INSTITUTE

## Assessing the Core Criteria for Optimal Regulation of the Private SECURITY Industry in Republic of KOREA

Kim Dae-woon

*Yeungnam University, Gyeongsan, Republic of Korea*

### Abstract

*International survey of the private security industry has rejuvenated interest in its study, in what has been a period of intensive growth internationally over several decades. Regulatory survey and analyses have been conventionally confined to Australia, Britain and North America, while developments in other world regions remain unassessed. This article is intended to inform and document the the recurring issues and challenges associated with the security industry in Republic of Korea. This article examines growth and diversification; regulation focusing on oversight practices; and offers a critique of the industry, as well as discussions on areas of possible improvement in regulation. The findings suggest that, although sustained intensive growth is evident, such growth has not been representative of a comprehensive scheme, and as such partial coverage of security tasks, minimal underwriting of competency standards, and insufficient attention paid to proactive monitoring and support remain ongoing issues.*

*In light of the challenges outlined above, this article has discussed the range of strategies that could be pursued to complement a more comprehensive set of reforms, thereby optimizing the overall system. The major recommendation centers around three discussion areas. First, there appears to be a case for the policymakers to spread the legislative umbrella to embrace greater coverage of security tasks beyond the basic categories of static/armed guarding, close protection, cash-in-transit and alarm service, so that entry into the industry is controlled and monitored. Second, training has conventionally given a low priority due to ground that a two-year compulsory military service experience is adequate. Such assumption has resulted in a situation where the competency requirement is being avoided or neglected. Concurrently, there appears to be a case for the regulators and industry associations to engage in developing certified standards aimed at raising the bar of professionalism. Third, regulators should take advantage of cost-effective advances in monitoring programs in order to address the complexity of crime problems and benefit the industry in general.*

**[Keywords]** Republic of Korea, Private Security, Regulation, Training, Industry Management

### 1. Introduction

Scholarship on crisis prevention and community safety has tended to draw attention to the role of law enforcement[1]. The importance and functions of non-state bodies seem to have taken a rear-seat and long been disregarded, probably the consequence of distrust of private actors' genuine capacity to

root out misconduct and malpractice. Back in the early 1990s, Hertig distinguished the private sector security with the notion of the 'invisible empire of the criminal justice system'; the industry in general was perceived insignificant and vastly unacknowledged in mainstream research and review.

Over the past two decades then, the private security industry, once taken collectively as watchmen, inquiry agents or private guards, has successfully penetrated the public security domains, including at airports, seaports, mass transits, critical infrastructures and national landmarks. While the the industry's expanded presence in day-to-day order maintenance operations was earlier referred to as a 'quiet revolution' by Shearing and Stenning[2], it has now become increasingly difficult to envisage circumstances without the private security presence being engaged in safeguarding arrangements, whether for 'safeguarding of mega sporting events and mass gatherings', 'security screening of aviation sites' or 'border patrolling of drug smugglers and weapon traffickers'[3]. Security personnel in major cities are often first responders in case of security crisis or other emergencies, and the increasing

presence of commercial security providers in communities considered to have made a major contribution to tackling crime through deterrence activities[4].

## 2. Preceding Researches

As the role of the industry continually expands and diversifies, the solid growth in size of security has been widely documented. While the dynamics of this development have initially stirred interest amongst academia in Australia, Great Britain and North America, available reports indicate that Republic of Korea has experienced dynamic growth since the 1960s, which is similar to that of western counterparts[5]. Despite this, to date, the number of Republic of Korea-specific private security industry regulatory studies published in English-language journals remains relatively few, as outlined in <Table 1> below.

**Table 1.** Preceding researches.

Researcher	Main content
Lee (1995)	A pioneering work on the growth determinants of for-profit security in Republic of Korea, surveying the main drivers of regulatory reform initiatives and identifying the central challenges associated with the proper management of industry growth; that is, a trend towards monopolistic market structure and the widening revenue gap between the conglomerate companies and the regional security firms[6].
Lee (2004)	Surveyed the key turning point events and the prevailing political climate that was critical for the expansion of compulsory licensing requirements in the parameters of probity, competency and compliance checks, with comparisons drawn with the North American reform experience[7].
Button & Park & Lee (2006)	Priority areas which remain pending are identified since the inception of the Security Industry Act 2001, with a major focus being on licensing of unregulated grey sector of the industry, notably private investigation services, and improving competency assurance requirements that include managers and owners[8].
Button & Park (2009)	Interview of in-service operatives found that an insufficient level of access was provided to attain know-hows in the core subject areas of knowledge of law and legal powers, and that more prompt intervention was of great interest[9].
Lee (2014)	The issue of regulatory challenges was linked to factors including allegation of misconduct and incompetency of security officers, the use of casuals and inexperienced personnel, poor training, and misleading advertising of security services[10].
Kim (2015)	The lagging issues surrounding the licensing regime are surveyed and discussed; that is, the need for a more proactive approach to monitoring and regulating the burgeoning security industry and move away from a reactive approach in a form of ad hoc legislation and patchy amendment regulation that applied to specific provisions[11].

This article extends these earlier studies by tying together the documented changes and discussing the subject of regulatory optimization. Overall, this article is constructed around five discussion points: 1) explanations about the growth determinants of the security industry; 2) coverage lapses; 3) recurring conduct problems associated with the industry; 4) gaps in the training scheme; and 5) recommendations for optimal regulation. The following brief overview maps out current demographics of Republic of Korea and growth profile of the industry, which are pertinent to the understanding of the range of regulatory issues to be explored in this article.

### 3. Developmental Theory of Private Security Service

Republic of Korea (38,691 square miles) is roughly the size of England (77 per cent) or about one fourth the size of Japan. The gross domestic product (GDP) in Republic of Korea, as reported by the World Bank (2016), averaged around US\$1,700 in 1960, and has since increased to \$28,000 range, placing the country 29th (among 175 countries and territories) on this indicator. The private sector security in Republic of Korea has experienced a similar growth curve over the period 1970–2016, advancing from less than 800 personnel to an

industry of more than 150,000 registered personnel and 4,500 firms, compared with about 114,000 police. Two decades earlier, in 2000, police numbers outstripped that of security.

The demand for for-profit security in Republic of Korea is driven by needs similar to that of most commercial states. For example, security staff are a necessity to keep premises safe and provide cash carrying services. Security solutions are also extensively implemented at the manufacturing facilities, where the bulk of valuables are handled through specialist services. Round-the-clock checks, monitoring of CCTV systems and responding to unverified alarms are time consuming, and not always a good strategic use of highly-trained police resources. That being said, explanations about the growth determinants of the commercial security have included the following sets of theories that reveal different reasons for the rise in non-state policing (see <Table 2>).

In sum, the trend towards a two-tier or hybrid forms of policing has been boosted by the comparative cost advantage of private security over the police. That is, a labour cost gap. The added value of mobilizing the private sector capacity also lies in its specialization. The private security industry consists of diverse divisions catering to a wide base of clientele.

**Table 2.** Developmental theory of private security service.

Researcher	Theory
Shearing, Stenning (1981)	Emergence of mass private property.
Shearing, Stenning (1983)	A paradigm shift away from the dependence on the state police to alternative 'self-help' solution.
Jones, Newburn (1998)	The loss of secondary social controls delivered through a community safety net.
von Hirsch, Shearing (2000)	Resurgence of exclusionary communal spaces, such as gated and walled communities.
Brantingham (2000)	The spread of knowledge about situational or opportunity reduction approaches to crime prevention.
Wilson, Sutton (2003)	Cost-effective innovations in security technology.
Prenzler, Sarre (2008)	The post 9/11 counter-terrorism agenda.
van Dijk (2012)	Responsive securitization.

#### 4. Current State of Private Security Service in Republic of Korea: License Category

As the role of the industry continually expands, on a par with the availability and affordability of new technologies, the diversification of the industry has been widely documented[12]. In many parts of Western Europe, the range of regulated activities is recognized across nine service areas, providing 'nearly complete coverage' of all major license categories, including, for example, security consultant, security seller, electronic equipment specialist, security trainer and master license holder[13].

Nevertheless, such more sophisticated aspect of private security is less apparent in Republic of Korea in that the licensing framework do not extend beyond the five occupational domains. These encompass categories of: static guarding, close protection and bodyguarding, alarm and monitoring, cash-in-transit, and national facilities protection(i.e. armed guarding: exclusively operates around certain infrastructures as determined by the chief executive).

Moreover, in Republic of Korea, the types of activities undertaken by security are predominantly concentrated in the labor-intensive manpower area of static guarding(over 80%), ranging from basic facilities maintenance to other miscellaneous manual tasks without a sharp security focus. That being said, capital-intensive and lucrative technical security systems side of industry are dominated by the 'Big Three' conglomerates, namely S-1, ADT Caps, and KT Telecop, with a combined market share of over 85 percent.

#### 5. Industry Risk Profile in Republic of Korea

While private security sector has grown to become US\$2.7 billion industry in Republic of Korea, there remains cynicism about the management of growth, notably the trends of aggressive 'cut-price' competition and monopolistic market structure that has coin-

ceded with poor service standards and scandalous events associated with security providers.

As recently as January 2013, over 500 security firms found to be non-compliant to licensing conditions. The adverse publicity surrounding the industry scandal concerned the recurrent nature of misconducts, outstandingly 'assaults', 'manipulation of compulsory pre-entry, on-the-job and follow-up training requirements', 'the use of casuals, non-licensed and inexperienced security personnel', 'carrying out security tasks whilst out-of-uniform', 'illegal third-party subcontracting practices', 'fraudulent misrepresentation of managers, owners and partners of security organizations' and 'breach of disqualification order(i.e. continued operation in the industry after having its trade license revoked)'[14].

A year later, in 2014, a major scam was further uncovered within S-1 and ADT Caps, the top two leading security service providers in Republic of Korea. It was revealed that, to boost margins, these companies participated in anticompetitive business practices, via price-fixing and market division schemes that lasted for a decade[15]. The exposé – described as the 'tip of the iceberg' – aroused much negative scrutiny over the recurrent nature of malpractice and adequacy of regulatory system in place. Given the significance of the functions in which the industry is involved, further regulatory refinements are warranted to ensure a proper level of professional integrity and competency in the industry.

#### 6. Issues in Competency Requirements

Conventionally, in Republic of Korea, there had been little in the way of government-sponsored initiative other than prescribing minimum standards of training. Currently, new entrants obtaining a guarding permit are trained in law, public relations, crime prevention, workplace safety procedures, self-defense, emergency preparedness, fire safety, crowd conflict resolution techniques and first aid. In contrast, the standards set in some European countries are such that training in alarm and CCTV monitoring alone carry up to

70 hours of rigorous training. Concurrently, there appears to be a case for the Republic of Korean policymakers to engage in promoting common core standards across the industry, with the centralized licensing authority guiding learning hours, curriculum contents, and assessment procedures.

In the UK, the stand-alone regulator for the private security industry – the Security Industry Authority(SIA) – initially oversee the entry-level vocational education and training programs that are designed to address core content areas. Thereafter, specialist training and managerial-level officer training programs are managed by accredited awarding organizations, alongside the higher education institutions(e.g. college). The main rationale is to ensure sufficient level of knowledge in the core subject areas of ‘knowledge of law, legal powers and responsibilities, and specific requirements of regulation’. This model, a multi-layered approach to training, appears to be optimal, in terms of the extent to which the competency pathways are consistently covered.

The UK training regime can serve as the appropriate model template for the Republic of Korean policymakers in establishing a competency framework. Nonetheless, administration of the UK regime was accused of alleged shortcomings, notably lapse in the examination system with the SIA permitting training organizations to run their own assessment program. Such shortcoming can be taken into account during future consideration in developing add-on arrangements best suited to the Republic of Korean setting.

## **7. Conclusion**

### **7.1. Comprehensive licensing**

Internationally, the modern security industry has grown to become more sophisticated and multi-task capable industry, to the point that private sector operators are assuming roles conventionally assigned to the state. Nevertheless, there is limited evidence of such an active engagement in Republic of Korea due to the inadequacies in existing li-

ensing arrangements. To date, private investigation services remain prohibited, rather than professionalized and fly-by-night operators dictates the sector with little thought given to the best interests of the community. Ideally, licensing should be comprehensive, covering all relevant occupational and operational aspects of security work across the industry.

### **7.2. Compulsory training**

A Comprehensive training of security tasks is of a strategic imperative. Security providers serve the majority of shopping complexes, business precincts, key installations, tourist attractions, and mass gatherings and events - all known to be terrorist targets. This also means that security providers may be the first to detect and respond to adverse events. That said, in major cities security personnel should be promoted to the role of first responders with longer training periods with a wider curriculum, in the aspects of legal rights, statutory obligations and ethics, as well as competency in paramedics which is essential for the safety of public and security providers themselves.

### **7.3. Continuous monitoring**

The benefit of intervention to the industry should be sufficient to raise standards to a level of attaining the primary goal, which is, developing the industry as appropriate partners for the police. From a reading of the available sources, it appears that in many countries the preferred approach to monitoring this burgeoning industry has been wider application of real-time crime/incident log checking, backed up by the Automated Fingerprint Identification System and a central vetting repository where the real-time records of license holders and applicants are centrally stored and disseminated. These initiatives are linked to consolidating the variety of vetting tasks that are carried out by often short-handed regional agencies. Simultaneously, the monitoring approach in Republic of Korea should be ‘information-driven’ and emphasizes on developing ‘measurable outcomes’.

## **8. References**

## 8.1. Journal articles

- [6] Lee YK. Tasks Facing Korea's Private Security Business and Its Prospects for the 2000's. *International Journal of Comparative and Applied Criminal Justice*, 19(2), 223-238 (1995).
- [7] Lee CM. Accounting for Rapid Growth of Private Policing in South Korea. *Journal of Criminal Justice*, 32(2), 113-122 (2004).
- [8] Button M & Park HH & Lee JL. The Private Security Industry in South Korea: A Familiar Tale of Growth Gaps and the Need for Better Regulation. *Security Journal*, 19(3), 167-179 (2006).
- [9] Button M & Park HH. Security Officers and the Policing of Private Space in South Korea: Profile Powers and Occupational Hazards. *Policing and Society*, 19(3), 247-262 (2009).
- [10] Lee JL & Lee S & Kim JS. The State of Security Law Violations by the Private Security Businesses in Seoul and Countermeasures. *Journal of Public Administration and Governance*, 4(3), 159-170 (2014).
- [11] Kim DW. The Development of the Private Security Industry in South Korea: History Progress and Critical Issues 1950-2014. *Journal of Criminological Research Policy and Practice*, 1(3), 143-158 (2015).
- [12] Prenzler T & Sarre R. The Evolution of Security Industry Regulation in Australia: A Critique. *International Journal for Crime and Justice*, 1(1), 38-51 (2012).
- [13] McCrie D. Progress and Problems of Security in Millennial Society: An Essay for the 25<sup>th</sup> Volume of Security Journal. *Security Journal*, 25(3), 191-198 (2012).

## 8.2. Books

- [1] Jones T & Newburn T. Private Security and Public Policing. Clarendon (1998).
- [2] Shearing C & Stenning P. Modern Private Security: Its Growth and Implications In M Tonry & M Norval Crime and Justice An Annual Review of Research. University of Chicago (1981).

## 8.3. Additional references

- [3] <https://www.ncjrs.gov/> (2010).
- [4] <http://www.oecdbetterlifeindex.org/> (2014).
- [5] <http://www.coess.org/> (2012).

[14] <http://www.mk.co.kr/> (2103).

[15] <http://www.asiatoday.co.kr/> (2014).

### Author

**Kim Dae-woon** / Yeungnam University Lecturer  
B.A. Michigan State University  
M.S. John Jay College of Criminal Justice  
Ph.D. Griffith University

### Research field

- Reforming Security Industry Training Standards: An Australian Case Study, *International Journal of Comparative and Applied Criminal Justice*, 41(4) (2017).
- Assessing a Strategic Framework for Managing the Regulatory Standards Abroad and Its Implications for South Korea: Based on Evaluation Criteria by Button & George, *Journal of Korean Public Police and Security Studies*, 14(1) (2017).

### Major career

- 2008~2009. Hansei University, Lecturer
- 2015~present. Yeungnam University, Lecturer

Publication state: Japan  
ISSN: 2189-7603

Publisher: J-INSTITUTE  
Website: <http://www.j-institute.jp>

Corresponding author  
E-mail: [applej77@hanmail.net](mailto:applej77@hanmail.net)

Peer reviewer  
E-mail: [editor@j-institute.jp](mailto:editor@j-institute.jp)

<http://dx.doi.org/10.22471/crisis.2017.2.4.27>

© 2017 J-INSTITUTE

## Attachment SECURITY and Behavioral Problems of Middle Childhood Boys in Republic of KOREA

Kang Su-jeong<sup>1</sup>

*Seoul National University, Seoul, Republic of Korea*

Choi Eun-jung<sup>2\*</sup>

*Seoul National University, Seoul, Republic of Korea*

Yi Soon-hyung<sup>3</sup>

*Seoul National University, Seoul, Republic of Korea*

### Abstract

*This study examined the relationship between attachment security and clinical behavioral problems in a sample of 155 middle childhood boys in Republic of Korea. We tested the following hypotheses: 1) attachment security is associated with internalizing problems in middle childhood boys and 2) attachment security is associated with externalizing problems in middle childhood boys. Semi-structured interview (Separation Anxiety Test) was applied to identify the attachment security, and K-CBCL was used to measure behavioral problems. Frequency analysis and chi-square test were conducted to identify clinically risky groups in behavioral problems and to investigate the association with attachment security.*

*The results of this study indicated that boys with insecure attachment type were more identified as a semi-clinical/clinical group in internalizing problems, but not in externalizing problems. These results were consistent with some previous studies which reported the relationship between attachment security and internalizing problems, but in contrast to other studies which suggested the association between attachment security and externalizing problems. Future studies are needed to further clarify the relationship between attachment security and externalizing problems of middle childhood boys in Republic of Korea. This study has following implications. First, we evaluated attachment security in middle childhood boys applying semi-structured attachment interview rather than self-report questionnaires to access the complexity and verbal and non-verbal expressions of attachment representations. Also, this study showed the relationship between attachment security and internalizing/externalizing problems in middle childhood boys who have been less investigated in previous studies. Finally, this study suggested that insecure attachment in middle childhood boys has clinical implication in internalizing problems.*

**[Keywords]** Attachment Security, Behavioral Problems, Middle Childhood, Boys, Republic of Korea

### 1. Introduction

Attachment refers to an emotional bond between a child and his/her caregiver[1]. The quality of attachment depends on the caregiver's availability and responsiveness to the child's needs. If parents are responsive and provide the child with support and comfort during distressing situation, the child can construct a secure base, which enables the child to trust adults and develop confidence in exploring the environment with positive representations of self and others. On the

other hand, parents who are dismissive or inconsistent of children's emotional reactions foster insecure attachment styles, resulting in the child's negative representations of self and others[2]. To this date, studies have consistently reported that secure attachment provides a healthy foundation for development, whereas insecure attachment is likely to be associated with difficulties in personality development and clinical symptoms such as internalizing and externalizing problems. The evidence suggests that children who have formed secure attachment to their caregivers

are less likely to experience clinical symptoms. Some studies found that secure attachment is linked to lower level of internalizing problems[3][4][5] and externalizing problems[6][7]. However, there is still a discrepancy between findings of the relationship between attachment security and behavioral problems[8]. This is partly attributable to different methods to assess attachment security and behavioral problems across studies. Especially, middle childhood has been largely ignored by attachment research even though middle childhood is an important period of development in that attachment is influenced by broader developmental context and provides the foundation of behavioral problems emerging in adolescence.

Previous studies have usually measured attachment security in middle childhood using self-report questionnaires. For example, one study measured attachment security with questionnaires reflecting children's perception of intimate relationships with their parents[9]. Other studies assessed attachment security through questionnaires composed of three subcategories; trust, communication, and alienation[10][11][12]. The attachment development in middle childhood, however, is identified as significant changes of attachment behavior and attachment representations. During this period, the goal of attachment system changes from proximity to the availability of attachment figure[13]. Children develop cognitive models of their relationship with attachment figure, thus the assessment of representations needs to focus on an individual's generalized and internalized model of attachment relationships. However, in spite of these changes, attachment figure continues to function both as safe havens in time of distress as well as secure bases that support a child's exploration[14][15].

The purpose of this study was to clarify the relationship between attachment security and behavioral problems in Korean middle childhood boys. We applied a semi-structured interview method to measure the complexity of children's attachment representations reflected in verbal and non-verbal expressions of attachment representations. We

used projective pictures, which activated children's attachment system, to approach conscious and unconscious emotions and thoughts reflecting attachment security during the interview.

We also aimed to identify semi-clinical/clinical groups in internalizing and externalizing problems and to investigate if insecure attachment type in middle childhood is more likely to have risks for psychopathology.

We tested the following hypotheses: 1) attachment security is associated with internalizing problems and 2) attachment security is associated with externalizing problems.

## 2. Methods

### 2.1. Participants

Participants were recruited from Seoul and Gyeonggi Province of Korea. We sent letters to elementary schools inviting boys to participate in this study. Two hundreds and eight boys in the third and fourth grade and their parents were participated. One hundred and fifty-five cases were finally selected for the analysis, except for 22 cases that did not respond to the CBCL and 31 cases that were not properly classified through Attachment Security Test. All of participants were confirmed to have no experience of separation from their mother due to divorce or bereavement. Boys' ages were ranged from 100 to 130 months, with an average age of 114.81 months( $SD = 7.79$ ).

Based on the attachment interviews, the subjects were divided into secure attachment type and insecure attachment type. We explored the demographic differences in each attachment type, and confirmed that there were no group difference in parents' education levels and social economic status reported by mothers.

The data used in this study belongs to the research project 'Neural plasticity of empathetic networks in insecurely attached children: The effects of brain-based intervention programs for children and parents' supported by National Research Foundation of Korea in

2014. This research project was initially designed to investigate the neural correlates of attachment security in middle childhood boys. For this reason, the research subjects were limited to all boys.

## 2.2. Measures

### 2.2.1. Attachment security

The modified version[16] of Separation Anxiety Test(SAT)[17][18] was used to evaluate attachment security in middle childhood boys. The SAT, a semi-structured interviewing system, was designed to activate children's attachment system through six pictures depicting separation situations from parents and to access their emotions and thoughts related to attachment figure and their relationships.

Boys were visited at home by a trained interviewer and interviewed in a quiet space. Interview process was recorded with the consent of the child and the mother in advance. Recordings in terms of verbal and non-verbal expressions such as intonations or pauses were transferred and coded, and used for analysis. The facial expressions and behaviors of the child during interview were also coded based on the interviewer's notes to reflect non-verbal expressions.

The content of interview and the notes recorded by researchers were analyzed according to the coding guideline[19]. Coding system concludes following nine scales; 1)emotional openness and vulnerability, 2)solution, 3)coherence of transcript, 4)anxiety, 5)dismissing/devaluing of attachment, 6)resistance/withholding, 7)displacement of feelings, 8)self-blame, and 9)preoccupied anger. Participants were divided into secure attachment type or insecure attachment type based on the score in each scale.

### 2.2.2. Behavioral problems

The Korean version of the Child Behavioral Check List(K-CBCL)[20] was used to measure behavioral problems. In this study, items for internalizing problems and externalizing problems were selectively used. Internalizing problems consist of anxiety/depression, withdrawn/depression, and somatic complaints.

Externalizing problems consist of delinquent behavior and aggressive behavior.

For the purpose of this study, participants were divided into non-clinical group and semi-clinical/clinical group in internalizing and externalizing problems. We considered T-scores of 60 and above as 'semi-clinical/clinical group', and the rest as 'non-clinical group' based on the guideline[20].

## 2.3. Statistical analysis

Statistical analyses were performed using IBM SPSS Statistics 20. Frequency analysis and chi-square test were used to analyze the difference in behavior problems according to attachment security.

## 3. Results

### 3.1. Attachment security and internalizing problems in middle childhood boys

As shown in <Table 1>, attachment security was significantly associated with clinical status on internalizing problems( $\chi^2 = 6.00, df = 1, p < .05$ ). In case of secure attachment type, there were 77 boys(85.6%) in non-clinical group and 13 boys(14.4%) in semi-clinical/clinical group. In insecure attachment type, 45 boys(69.2%) were in non-clinical group and 20 boys(30.8%) were in semi-clinical/clinical group. These results show that boys of insecure attachment type are more likely to be classified as semi-clinical/clinical group than boys of secure attachment type.

Chi-square test was conducted for each subcategory of internalizing problems; anxiety/depression, withdrawn/depression, and somatic symptoms. There was no significant group difference on clinical status according to attachment security.

### 3.2. Attachment security and externalizing problems in middle childhood boys

As shown in <Table 2>, attachment security tended to be associated with clinical status on externalizing problems that 16 boys out of 90(17.8%) were assigned to semi-clinical/clinical group in secure attachment type

while 14 boys out of 65(21.5%) in insecure attachment type, but the group difference was not significant.

Chi-square test was conducted for each subcategory of externalizing problems; delinquent behavior and aggressive behavior. There was no significant group difference on clinical status according to attachment security type.

**Table 1.** Attachment security and internalizing problems in middle childhood boys.

		Internalizing problems			$\chi^2$
		Non-clinical	Semi-clinical/ clinical	Total	
Secure attachment	Observed frequency	77	13	90	6.00*
	Expected frequency	68.5	21.5	90.0	
	%	85.6	14.4	100.0	
Insecure attachment	Observed frequency	45	20	65	
	Expected frequency	49.5	15.5	65.0	
	%	69.2	30.8	100.0	
Total	Observed frequency	122	33	155	
	Expected frequency	122.0	33.0	155.0	
	%	58.1	41.9	100.0	

Note: N = 155  
\*P < .05.

**Table 2.** Attachment security and externalizing problems in middle childhood boys.

		Externalizing problems			$\chi^2$
		Non-clinical	Semi-clinical/ clinical	Total	
Secure attachment	Observed frequency	74	16	90	0.34
	Expected frequency	72.6	17.4	90.0	
	%	82.2	17.8	100.0	
Insecure attachment	Observed frequency	51	14	65	
	Expected frequency	52.4	12.6	65.0	
	%	78.5	21.5	100.0	
Total	Observed frequency	125	30	155	
	Expected frequency	125.0	30.0	155.0	
	%	80.6	19.4	100.0	

Note: N = 155

#### 4. Discussion

The object of this study was to investigate whether insecure attachment in middle childhood boys is associated with clinical status on internalizing and externalizing problems. The

results indicated that attachment security is related to clinical status on internalizing problems in middle childhood boys. This result is consistent with previous studies reporting the association between attachment security and internalizing problems[9], depression[12], or emotional problems[11]. Establishing a secure relationship with responsive caregivers and sharing emotional experience with them support children's emotional regulation and communication skills. These abilities help children to control their own emotions and to cope with negative emotions[21][22]. Thus, boys with high attachment security are less likely to experience internalizing problems.

We found that boys of insecure attachment type are more likely to be identified semi-clinical/clinical group in externalizing problems, but the group difference was not significant in this study. Previous studies about the relationship between attachment security and externalizing problems have reported inconsistent findings. For example, one study[8] showed the relationship between attachment security and aggressive behavior was not significant. On the other hand, other studies reported that attachment security and externalizing problems were related[9][10][11][23]. One reason for inconsistent findings is that there exist various mediating factors between attachment security and externalizing problems such as maternal depression, psychopathology[24] or personal traits[8]. Therefore, the future studies are needed to clarify the effect of attachment security on externalizing problems.

This study has several limitations. First, the result from this study is not representative for the entire middle childhood as only boys were included. Future studies including girls are required, given that gender difference have been reported in behavior problems. Also, since the data was based on cross-sectional information, there is a limit to clearly describing the casual effect of attachment security on the clinical status in behavioral problems. Therefore, additional longitudinal studies are needed.

Despite these limitations, this study has significant implications. We measured attachment security in middle childhood boys using semi-structured interview method rather than self-report questionnaires to access the complexity of attachment representations and verbal and non-verbal expressions of attachment representations. Also, this study showed the relationship between attachment security and clinical status on internalizing and externalizing problems in middle childhood boys who were less examined in previous studies. Finally, this study suggests that insecure attachment type in middle childhood is a more influential risk factor for internalizing problems compared to externalizing problems.

## 5. References

### 5.1. Journal articles

- [2] Steal H & Steal M. Attachment and Psychoanalysis: Time for a Reunion. *Social Development*, 7(1), 92-119 (1998).
- [3] Bohlin G & Hagekull B & Rydell AM. Attachment and Social Functioning: A Longitudinal Study from Infancy to Middle Childhood. *Social Development*, 9(1), 24-39 (2000).
- [4] Easterbrooks MA & Abeles R. Windows to the Self in 8 Year Olds: Bridges to Attachment Representation and Behavioral Adjustment. *Attachment & Human Development*, 2(1), 85-106 (2000).
- [5] Harold GT & Shelton KH & Geoke Morey MC & Cummings EM. Marital Conflict Child Emotional Security about Family Relationships and Child Adjustment. *Social Development*, 13(3), 1350-1376 (2004).
- [6] Davies PT & Cummings EM & Winter MA. Pathway between Profiles of Family Functioning Child Security in the Interparental Subsystem and Child Psychological Problems. *Development and Psychopathology*, 16(3), 525-550 (2004).
- [7] El-Sheikh M & Buckhalt JA. Parental Problem Drinking and Children's Adjustment: Attachment and Family Functioning as Moderators and Mediators of Risk. *Journal of Family Psychology*, 17(4), 510-520 (2003).

- [8] Baek HJ & Hwang HK. The Effects of Parents-related Variables and Self-related Variables on Children's Emotional and Behavioral Problems. *The Korean Journal of Developmental Psychology*, 19(3), 1-27 (2006).
- [9] Kang JH. Developmental Trajectories of Internalizing and Externalizing Problems in Late-childhood: The Effects of Children's Gender Perceived Academic Achievement, Parents Behaviors and Peer Relations. *The Korean Journal of Elementary Counseling*, 13(1), 155-173 (2014).
- [10] Choi ES & Jung SA. The Structural Relationship among Attachment of Children Emotional Identification and Expression Abilities Social Abilities and Behavioral Problems. *The Korean Journal of School Psychology*, 9(3), 443-464 (2012).
- [11] Chun EC & Lee JS. The Relationship between Children's Attachment to Mother Anger and Emotional Behavioral Problems. *Journal of Korean Management Association*, 28(6), 157-167 (2010).
- [12] Min HY. The Relationship between Mother Attachment and Depression: The Mediation Effect of Peer Attachment in School Aged Children. *Korean Journal of Human Ecology*, 21(5), 915-927 (2012).
- [14] Kerns KA Tomich PL & Kim P. Normative Trends in Children's Perceptions of Availability and Utilization of Attachment Figures in Middle Childhood. *Social Development*, 15(1), 1-22 (2006).
- [15] Vandeviver E & Braet C & Bosmans G. Under Which Conditions Do Early Adolescents Need Maternal Support? *Journal of Early Adolescence*, 35(2), 162-169 (2015).
- [18] Slough NM & Greenberg MT. Five Year Olds Representations of Separation from Parents: Responses from the Perspective of Self and Other. *New Direction for Child and Adolescent Development*, 48, 67-84 (1990).
- [21] Crittenden P. Quality of Attachment in the Preschool Years. *Developmental Psychology and Psychopathology*, 4, 209-241 (1992).
- [23] Fearon RP & Bakermans Kranenbug MJ & IJzendoorn MH & Lapsley AM & Roisman GI. The Significance of Insecure Attachment and Disorganization in the Development of Children's Externalizing Behavior: A Meta Analytic Study. *Child Development*, 81(2), 435-456 (2010).
- [24] Munson JA & McMahon RJ & Spieker SJ. Structure and Variability in the Developmental Trajectory of Children's Externalizing Problems: Impact of Infant Attachment Maternal Depressive Symptomatology and Child Sex. *Development and Psychopathology*, 13(2), 277-296 (2001).

## 5.2. Thesis degree

- [16] Choi EJ. An fMRI Study of Children's Neural Responses according to the Level of Attachment Security. Seoul National University, Doctoral Thesis (2014).

## 5.3. Books

- [1] Bowlby J. Attachment and Loss: Vol 2 Separation Anxiety and Anger. Basic Books (1973).
- [13] Bowlby J. Attachment and Loss: Vol 1 Attachment. Basic Books (1982).
- [17] Hansburg HG. Adolescent Separation Anxiety: A Method for the Study of Adolescent Separation Problems. C. C. Thomas (1972).
- [20] Oh KJ & Lee H & Hong KE & Ha EH. K-CBCL. Chung Ang Aptitude (1997).
- [22] Greenberg MT & Speltz ML. Attachment and ontogeny of Conduct Problems. In J Belsky & T Nezworsk Eds. Clinical Implications of Attachment. Lawrence Erlbaum Associates (1988).

## 5.4. Additional references

- [19] Resnick G. Measuring Attachment in Early Adolescence: A Manual for the Administration Coding and Interpretation of the Separation Anxiety. Rockville MD (1993).

**Lead Author****Kang Su-jeong** / Seoul National University Ph.D.

B.A. Seoul National University

M.A. Seoul National University

Ph.D. Seoul National University

## Research field

- The Distribution of Attachment Types and Their Characteristics in Middle Childhood boys, Korean Journal of Child Studies, 37(5) (2016).
- Differences in Cognitive Abilities according to Attachment type in Middle Childhood Boys, The Korean Journal of the Human Development, 24(3) (2017).

## Major career

- 2012~2013. Center for Child Educare Service & Research Seoul National University, Science Teacher
- 2014. Center for Child Educare Service & Research Seoul National University, Teacher

**Corresponding Author****Choi Eun-jung** / Seoul National University Post-Doc fellow

B.A. Ewha Womans University

M.A. Seoul National University

Ph.D. Seoul National University

## Research field

- The Distribution of Attachment Types and Their Characteristics in Middle Childhood Boys, Korean Journal of Child Studies, 37(5) (2016).
- Differences in Cognitive Abilities according to Attachment type in Middle Childhood Boys, The Korean Journal of the Human Development, 24(3) (2017).

## Major career

- 2014~2015. Seoul National University, Post-Doc Fellow
- 2017~present. Holland Bloorview Kids Rehabilitation Hospital Toronto Canada, Post-Doc Fellow

**Co-Author****Yi Soon-hyung** / Seoul National University Emeritus Professor

B.A. Seoul National University

M.A. Seoul National University

Ph.D. Seoul National University

## Research field

- The Distribution of Attachment Types and Their Characteristics in Middle Childhood Boys, Korean Journal of Child Studies, 37(5) (2016).
- Differences in Cognitive Abilities according to Attachment type in Middle Childhood Boys, The Korean Journal of the Human Development, 24(3) (2017).

## Major career

- 2005~2007. The Korean Association of Human Development, President
- 2012~2015. Center for Child Educare Service & Research, Seoul National University, Center Chief