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Corresponding author
E-mail: samuel@deu.ac.kr

Peer reviewer
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Analysis and Implications of FIRE Vulnerability in Traditional Markets in Republic of KOREA

Ryu Sang-il¹

Donggeui University, Pusan, Republic of Korea

Lee Ju-ho^{2*}

Sehan University, Dangjin, Republic of Korea

Abstract

When a fire breaks out in traditional markets, it is difficult for firefighters to put out early and thus causes bigger damage. This study set out to examine the fire vulnerability of traditional markets and the reasons for difficult fire suppression there and propose improvement measures to prevent a fire in traditional markets at a preliminary level.

First, traditional markets are vulnerable to fires for the following reasons: property damage is a big characteristic in traditional market fires due to the goods stored in each store. There are many cases of using an electric heating appliance among the stores in traditional markets, which heightens the probability that a fire will spread and become a bigger one. In addition, traditional markets have existed for more than 20 years literally, being subjected to the greater risk of damage due to the deteriorated buildings and high density of stores and to the higher possibility of spreading fires due to the fire vulnerability of goods.

Second, it is difficult to take firefighting measures in case of fire in traditional markets despite their fire vulnerability for the following reasons: it is an often case that fire trucks have a difficult time getting to the fire due to chaotic street vendors around the market, narrow paths, and vehicles that are illegally parked or stopped near the access road, fail to suppress the fire early, and witness the fire spread into a great one when a fire breaks out in a traditional market. There are many overhead arcades installed to block rain and sunlight in traditional markets, where the roads and paths are narrow and complex. Helicopters thus face limits with fire suppression by sprinkling water. Finally, most of merchants in traditional markets are in their fifties or sixties and have a difficult time using a firefighting facility themselves.

Third, the concerned authorities need to do active inspection activities beforehand in fire hazard districts in order to manage traditional markets. The local governments often fail to designate and manage fire hazard districts and engage in fire prevention activities or special activities, thus exposing their vulnerability to fires. Furthermore, the education and training sessions are formally provided to the merchants in many cases, and many of them are old and have limits with using a firefighting equipment themselves in traditional markets.

Fourth, store owners also experience difficulties with recovering damage through insurance after a fire breaks out in traditional markets: first, most of store owners are small business owners in traditional markets and have a difficult time with receiving fire insurance benefits in case of a fire, which is partly because the insurance companies tend to avoid the undertaking of fire insurance for traditional markets with a high risk and partly because the small businessmen have a burden with purchasing insurance themselves. As a result, the fire insurance coverage is small in traditional markets, and the merchants face difficulties with minimizing their property damage in the recovery process after a fire break out.

Based on those findings, the study proposed a couple of measures to prepare for the fire vulnerability of traditional markets: first, fire prevention education should be provided to the merchants to alert them to a fire and help them develop response capabilities. Secondly, the local governments and firefighting authorities should reinforce the designation and management of fire hazard districts, provide training in which the merchants participate themselves in winter when the frequency of fire is high, and strengthen the special management for firefighting purposes.

1. Introduction

A great fire broke out in the Seomun Market in Daegu on November 30, 2016, driving the small businesses into the difficult time of agony and worry over damage and restoration measures. The fire broke out in Zone 4 of Seomun Market and spread to approximately 670 stores in the zone. The damage was especially bigger since the zone mainly contained clothing, bedding, accessories, and fabrics stores[1]. There was a fire in Zone 2 of Seomun Market in 2005, and it caused the damage of 68.9 billion won. Zone 4 is estimated to suffer the damage of 100 billion won or more for the fire. Right after the fire broke out, the Fire Defense Headquarters of Daegu dispatched 96 firefighting equipments including firefighting helicopters, pumpers, and tank lorries and 750 firefighters to the scene of the fire. They concentrated their force on preventing the fire spreading to nearby buildings, but they failed in early fire suppression[2].

In case of a fire in a traditional market, the firefighting authorities have a difficult time with extinguishing it early and face bigger damage. This study thus set out to examine the fire vulnerability of traditional markets and the reasons for difficult fire suppression there and propose improvement measures to prevent a fire in traditional markets at a preliminary level.

2. Fire Vulnerability of Traditional Markets

There are a couple of reasons why a fire breaks out frequently and often grows into a great one in traditional markets like the recent case of Seomun Market fire: the statistics of the last five years show that the average damage of a fire in traditional market fire cases was approximately 13,360,000 won, which is 1.7 times higher than 7,790,000 won, the average damage of a fire in the entire cases. It is because traditional markets are

subjected to greater property damage due to the goods stored in the stores in case of a fire.

In addition, there is a very high possibility of a fire spreading into a great one in traditional markets like the recent case of Seomun Market[3]. The biggest cause of a fire is the electrical factor. As the weather gets cold, merchants in traditional markets use many electric heating appliances including electric blankets and stoves and accordingly increase the risk of a fire.

When a fire breaks out in traditional markets where there is a high concentration of deteriorated buildings aged 20 years or older, the fire can easily spread to bigger areas. Since the stores are close to each other, one can easily pick up the fire from another. Furthermore, the major goods of fabrics serve as kindling and make the fire spread instantly[4].

3. The Actual State and Problems of Fire Suppression in Traditional Markets

It is common that quick firefighting measures reduce the size of damage. The firefighting authorities seem to have experienced difficulties with fire suppression in the recent case of Seomun Market.

It is difficult to put out a fire in traditional markets for the following reasons[5][6]:

First, it is an often case that fire trucks have a difficult time getting to the fire due to chaotic street vendors around the market, narrow paths, and vehicles that are illegally parked or stopped near the access road, fail to suppress the fire early, and witness the fire spread into a great one when a fire breaks out in a traditional market. Then there are many overhead arcades installed to block rain and sunlight in traditional markets, where the roads and paths are narrow and complex. Helicopters thus face limits with fire suppression by sprinkling water. Finally, most of mer-

chants in traditional markets are in their fifties or sixties and have a difficult time using a firefighting facility themselves.

There are regulations that the concerned authorities should designate an area with a high risk of growing fire damage like markets as a fire hazard district and take special control of it. The fire prevention measures might have been poor in the recent case of Seomun Market. According to the Framework Act on Fire Service, a fire hazard district should be designated and specially managed in areas with a high risk of fire and life damage such as markets, dense wooden buildings, and factories. The mayors or governors in the local governments have the authority to designate and manage a fire hazard district, and there are areas that should have long been designated and managed as a fire hazard district. Furthermore, fire prevent and special inspection activities based on the law are done only formally even in the designated fire hazard districts, which means poor fire prevention.

In addition, fire prevention education and training are also formal for the merchants in the markets in many cases. In the traditional markets, the merchants are mostly old and have a difficult time putting out a fire by using the firefighting facilities in the market even after the training. The Seomun Market in Daegu is a good case to demonstrate the fire prevention measures are not good yet since there were over 16 fires in the market including the great one in 2005[7].

It is more unfortunate that most of merchants in traditional markets are small business owners that have a difficult time receiving the fire insurance benefits. There are a couple of reasons why they have a difficult time receiving the fire insurance benefits[8][9]:

First, traditional markets have a big inherent fire risk, and the insurance companies are ironically reluctant to undertake the fire insurance of traditional markets because of their high fire risk. In addition, most of merchants in traditional markets are small business owners that have a burden with premiums, which explains the reason why the fire

insurance coverage remains low in traditional markets.

4. Improvement Measures for Fire Prevention in Traditional Markets

What improvement measures will be needed to prevent a fire in traditional markets?

First, fire safety and prevention education should be provided regularly to the merchants in traditional markets so that they will strengthen their safety consciousness and increase the abilities of making immediate responses to a fire in case of emergency. They should be offered materials to ensure their quick responses in case of a fire including live demonstrations about how to use a fire extinguisher and video clips on the initial know-how to deal with a disaster including fire, reactive measures in cases of electric, oil, and gas fires, evacuation methods, methods and know-how to use and manage a fire extinguisher, securement of emergency exits and fire truck paths, reinforcement of autonomous safety control, and fire escapes in community buildings and apartment houses.

Next, the local governments and firefighting agencies should offer advance training that will be of practical help to the merchants in traditional markets based on the participation of many merchants instead of annual formal firefighting training to prevent a great fire in winter. The local governments should especially designate and manage well market areas as fire hazard districts.

Finally, the firefighting authorities should reinforce the regular inspection of firefighting facilities and equipments including fire extinguishers and hydrants through special fire management and bust illegally parked or stopped vehicles more strongly to secure an access road for fire trucks[10][11].

The market merchants should in particular be more alert to a fire, be cautious with electric heating appliances, have fire extinguishers in place, and take active part in practice and training to increase their response capabilities. They will also need to form their own fire brigade in the market and purchase a fire

insurance no matter how difficult it may be[12].

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Lead Author

Ryu Sang-il / Dongeui University Professor
B.A. Cheongju University
M.A. Chungbuk National University
Ph.D. Chungbuk National University

Research field

- The Relationship between Organizational Culture and Organizational Competency of Fire Fighting Organizations, *Crisisonomy*, 12(2) (2016).
- A Review of Response Systems to Food Terrorism in the US: Implications for South Korea, *Crisisonomy*, 12(2) (2016).

Major career

- 2016~present. The Korean Association for Crisis and Emergency Management, Vice President
- 2016~present. International Society for Disaster Management, President

Corresponding Author

Lee Ju-ho / Sehan University Professor
B.A. Chungbuk National University
M.A. Chungbuk National University
Ph.D. Chungbuk National University

Research field

- The Relationship between Organizational Culture and Organizational Competency of Fire Fighting Organizations, *Crisisonomy*, 12(2) (2016).
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- 2009~present. The Korean Association for Crisis and Emergency Management, Director
- 2016~present. International Society for Disaster Management, Member

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Corresponding author
E-mail: jalhanda98@hanmail.net

Peer reviewer
E-mail: editor@j-institute.jp

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Challenges and Prospects of KOREAN NURSING

Park Min-hyang

Chungbuk Health & Science University, Cheongju, Republic of Korea

Abstract

The purpose of this study is to provide useful information for developing the policy for securing nursing work force in a desirable direction based on the understanding of the present situation and structure related to securing the nursing work force in Korean hospitals. In order to efficiently plan nursing work force and draft policy, data analysis and decision making based on objective data and systematic information collection are required.

First, the structure of policies to secure nursing work force should be clarified and evaluated.

The level of nurse workforce should be considered on the extension line of the supply and demand status of other medical personnel such as doctors. Therefore, the core data on the demand and supply status of the whole healthcare workforce at the regional and national level, data of the nurses' market economic situation, data demonstrating the effectiveness of nurses should be regularly updated and managed to be used as a rational decision-making material.

Second, the policy of simply increasing the numbers of nursing college admissions and establishing nursing jobs is not a fundamental solution. Improvement efforts are needed, such as setting minimum standards for arranging nurses, legalizing nursing staff placement standards and linking with health insurance fee, improving quality of education such as curriculum, creating environment and culture that nurses do not leave jobs, supporting for working place-home compatibility, increasing assignment life of nursing work force such as improving working condition of nursing work force and securing a stable supply condition by securing career nurses.

Third, it is necessary to revise and supplement the differential of nursing care fees. The rating scale for nurse grades which affects shortage of nurses, should be changed from the number of beds per one nurse to the number of patients. The continuing claim of nurses and hospitals regarding the nursing management fee differential is that the added level of nursing care fees is low. It is also necessary to consider resetting the level of nursing care fees by reevaluating the admission fee including the nursing care fee.

Fourth, we should shift attention from the aspect of expanding supply of nurses to the aspect of retention. With the expansion of supply of new nurses, consistent supply rationalization policy was not effective and produced idle nurses. We should seek ways for nursing staffs to work for a long time without leaving the medical institution. In order to achieve the results, we should collect various cases in working hours and working forms of nurses in various working forms, such as short-time work system, flex time system, staggered office hours, telecommuting, intensive working time system, shift system of various patterns, and implement policies according to the hospital situation.

Fifth, it is required to seek ways to prevent nursing staffs from concentrating on Seoul and the metropolitan area. We should consider introducing monetary incentives to encourage employment in affiliated local hospital.

[Keywords] Nursing Work Force, Medical Supply System, Health Care System, Nursing Policy, Intensive Working Time System

1. Introduction

The most important factor for improving citizens' health is medical resources, and among them, nursing work force is the most important factor. This is because nursing work force plays a pivotal role in the medical supply system. The world has entered a crucial point of changing health manpower policy. The lack of quality health manpower including nurses, is one of the biggest obstacles for building an effective health care system[1]. In February 2012, the Ministry of Health and Welfare announced 'the direction of reorganizing nursing work force' and it included the content of reorganizing current nursing staffs(nurses and nursing assistants) in three steps (nurses from four year colleges-the first class nursing staffs from junior colleges-the second class nursing staffs from high schools). In addition, it includes the content of introducing a career enhancement system that gives a qualification for nurses examination after a certain period of training to a working nursing staff with a certain career or more. Regarding to the reformation of the nursing workforce of Ministry of Health and Welfare, there are many different pros and cons in the healthcare system[2].

Imbalance between demand and supply is occurring due to increased number of sick beds in domestic medical supply organizations, unemployment of qualified nurses, and increased demand for nursing personnel according to the new nursing classification system. This imbalance between supply and demand is manifesting in various and complex forms of factors. That are, the numerical imbalance, qualitative imbalance and distributional imbalance of nursing work force. Among them, the numerical imbalance of nursing staffs is being a problem. Since many hospitals were newly added and expanded in order to cope with surging medical demand from the mid 90's, hospitals have had many difficulties in securing nursing work force. In addition, due to the preference of nursing staffs for large hospitals in major cities, local hospitals are having difficulties in obtaining new graduate nursing staffs. And due to previous nurses' 'phenomenon of changing jobs' to the hospitals in 7 major cities, they have

difficulties in providing nursing care to patients[3]. Therefore, the problem of nursing work force is a problem of the entire medical system. Conflicts and confrontations between the two groups constituting nursing work force can affect the entire health and medical community, and further, threaten the safety of the patient and the health of the public, and create social anxiety.

The various demand for nurses in hospitals, the increasing demand for long-term nursing care services, and etc. are increasing the demand for nurses in common. And the number of nurses in Korea is severely insufficient. Therefore, it is urgent to secure nurse work force. Nursing shortages are a global phenomenon spreading not only in advanced countries but also in other countries. The major cause of this is the decrease in supply comparing to increasing demand for nurses[4].

The factors affecting the supply and demand of nursing workforce can be integrated into 4 kinds, first, institutional factors such as civilian-centered medical system, market isation of healthcare industry and work force policy, second, environmental factors such as aging, increase in national income, and increase in demand for various nursing of good quality, third, factors of labor demand, such as competitiveness and scale expansion between hospitals, introducing new hospital administration and managing work force, deterioration of wages and working conditions, and fourth, labor supply factors such as stagnation of supply of new work force, increase of employee turnover rate and re-employment of idle workers[4].

In addition, the government sees that work force of working nurses is the acquisition of the qualification after two year's education in a community college, and is similar to that of Licensed Practice Nurse(LPN) in another country, and it can replace the work of insufficient nurses. It is still questioned whether the government's policy, namely, increasing the supply of new licensed nurses or creating a new quasi-nursing work force system can solve the current shortage of nurses in Korea. For this, this study aims to identify factors related to shortage in nursing work force

through the supply and demand of nursing staffs, and to suggest directions for desirable nursing policy in future.

2. Background

2.1. Education and licensing system for nurses and assistant staffs

As of 2011, there are 282,656 licensed nurses, and among them, 110,866 nurses are working in medical institutions, 500,492 are qualified nursing auxiliaries, and 112,204 are working nursing auxiliaries among them[5]. Currently, formal nursing education in Korea is divided into four-year college courses and three-year college courses. In 19th May, 2011, "four-year nursing course" is going to be introduced at a community college as a revision of the Higher Education Law, which encompasses the legal basis for nursing education to be unified into a four-year program, and the three-year nursing course is going to be converted into a four-year nursing by 2017. In addition, various systems for obtaining bachelor's degrees for nurses graduated from professional bachelor's degree were prepared. Nursing major course was established at Korea National Open University in 1991, self education system was introduced in 1992, Nursing Special Course for Bachelor's Degrees(RN-BSN) was introduced in 1996, credit recognition system was introduced in 2006, and intensive major course was introduced in 2008. In order to obtain a nurse license in Korea, one must pass a nurse national examination. Based on the revised medical law revised in February 2012, a person who is going to become a nurse is a graduate of a university or a community college majoring in nursing and a person certified from Evaluation Certification Agency, and the person must obtain a license from the Minister of Welfare after passing a nurse national examination as of 2nd, February, 2017. If we look at the Examination standards for 4-year nursing in Korea, at least 103 credits are required for graduation, and clinical practical training hours should be over 1,000 hours. In Korea, there is no additional obligation to maintain the license after the initial licensing. However, in recent years, it has been changed that nurses

and other medical personnel are required to submit employment status, working organization and working area, and completion of maintenance education to the Minister of Health and Welfare three times a year based on the employment law. The medical certificate registration system was enforced from 29th, April, 2012, and the reporting and repair work is being carried out by the Korean Nursing Association[6].

2.2. Current state of supply and demand of nursing work force

2.2.1. Current domestic and foreign status of nursing work force level

Nursing work force in Korea is currently being trained and divided as a four-year college and two-year college. In the last five years, the entrance quota for nursing has been steadily increasing. According to the Ministry of Education, Science and Technology, the entrance quota for nursing in the whole country that increased up to 11,176 in 2007, increased to 11,656 in 2008(increased up to 4.3% from the previous year), to 12,573 in 2009(increased up to 7.9% from the previous year) and to 14,183 in 2010 (increase up to 12.8% from the previous year), to 15,338 in 2011(increased up to 8.1% from the previous year) and to 17,006 in 2012(increased up to 10.9% from the previous year). Total of 5,830 people were increased for 5 years, and the quota in 2012 has been increased up to 52.27%, comparing to 2007[7][8]. In addition, the number of nurses released each year is increasing. This phenomenon is correlated with the increasing number of beds in domestic hospitals.

Nurses are the most important professional manpower at the forefront of all health care systems, and they are key people in advocating for the health of the people and providing safe and effective medical services. The definition of 'nurse' is diverse, which makes it difficult to estimate and compare the number of nursing personnel between nations. Here, nurse means Registered Nurse(RN). It is estimated that there are more than 16 million nurses worldwide[9].

If we look at the supply and demand of nurses in Korea in the long term, Oh(2010) prospected that supply of nurses will be insufficient until 2020, but the supply shortage is not as large as 8% of available nurses. And he reported that it is not a big problem in terms of total amount, if it is possible to attract idle nursing staff to labor market. Currently as of 2011, the number of licensed nurses is 282,656 and the number of active nurses is 110,866(Ministry of Health & Welfare, 2013) and only about 39% of licensed nurses are active[6].

2.2.2. Ratio of nurse-assistant by type of medical institution

Nursing staff such as midwives, nurses, and nursing assistants increased rapidly from 185,660 in December 2004 to 263,097 in the fourth quarter of 2013. Looking at the changes in the percentage of nursing staff, the number of nurses increased from 48.3% to 51.2%, while that of nurse-assistants decreased slightly from 51.0% to 48.4%. The proportion of nurses of large medical institutions such as upper general hospitals and general hospitals increased generally, according to the type of medical institutions. The number of nurses in the upper general hospitals increased from 84.4% in December 2004 to 91.7% in the fourth quarter of 2013, while the number of nursing assistants decreased from 14.6% to 8.0%. The number of general hospital nurses increased from 82.5% to 85.9%, and nursing assistants decreased from 16.0% to 13.3%. Nursing hospitals, hospitals, and dental hospitals have significantly decreased in nurses' ratio[7].

2.2.3. Expansion of community-centered nursing area through introduction of longterm care insurance

By the end of 2013, 15,704 Longterm Care Facilities were operated, and there were 11,056 inhome services facilities occupying 70.4%, and there were 4,648 facility institutions occupying 29.6%. It is expected that the number of deployed personnel will increase, as the number of Longterm Care Facilities increases.

As of the end of 2013, the number of medical care companies increased by 8.2% from the previous year to 252,663, the number of social workers increased by 11.2% to 7,506, and the number of nursing assistants increased by 15.1% to 7,552. The number of nurses is decreasing every year since 2009, and in 2013 2,627 people are working. As the number of future visits increases and the importance of providing and administering home care services increases, the role of nurses with specialized skills will increase.

2.2.4. Regional disparities in nurse supply

The causes of the shortage of nurses in rural small hospitals can be divided into structural factors, hospital environment and institutional factors according to the characteristics of nurses' work. The structural factors of nurses' job characteristics include 24-hour shift, night and weekend work, high labor intensity, relatively low wage, working style and poor working conditions[10]. It is known that nurses avoid working at local hospitals due to low wages and poor working conditions in local hospitals(especially small and medium hospitals). According to a study by[11] that analyzed changes in nurses' wages, the difference in wages between nurses in large medical institutions in Seoul and small and medium hospitals not in Seoul widened to 1,050,000 won in 2009 from 852,000 won in 2002[12]. also found that salaries of nurses in the metropolitan area were more than 3 million won than megalopolis area, and megalopolis area was 1.2 million more than provincial area.

3. Conclusion

The purpose of this study is to provide useful information for developing the policy for securing nursing work force in a desirable direction based on the understanding of the present situation and structure related to securing the nursing work force in Korean hospitals. In order to efficiently plan nursing work force and draft policy, data analysis and decision making based on objective data and systematic information collection are required.

First, the structure of policies to secure nursing work force should be clarified and evaluated.

The level of nurse workforce should be considered on the extension line of the supply and demand status of other medical personnel such as doctors. Therefore, the core data on the demand and supply status of the whole healthcare workforce at the regional and national level, data of the nurses' market economic situation, data demonstrating the effectiveness of nurses should be regularly updated and managed to be used as a rational decision-making material.

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Author

Park Min-hyang / Chungbuk Health & Science University
Professor

B.A. Daejeon Institute of Science and Technology University

M.A. Chungbuk National University

Ph.D. Chungbuk National University
Korea University

Research field

- Regulation Effects of Emotional Leadership in the Relationship Between Job Stress and Organizational Commitment of Hospital Nurses, *Crisisonomy*, 11(2) (2015).
- Impact of Parents' Attachment Behaviors on Stress Coping Ability and Suicidal Impulse Control Among College Students, *Crisisonomy*, 12(3) (2016).

Major career

- 2013~present. The Korean Association for Comparative Government, Academic Director
- 2015~present. Crisis and Emergency Management Theory and Practice, Academic Director

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

Corresponding author
E-mail: cksaint@cni.re.kr

Peer reviewer
E-mail: editor@j-institute.jp

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What Do We Have to Do for the Preparedness of ARSON FIRE?

Cho Seong

Chungnam Institute, Gongju, Republic of Korea

Abstract

This study arises from the awareness that it requires a study about the method of preparedness from arson in our society and the study will present the literature based approach provided with evidences and theses in both domestic and foreign cases. Arson threatens people's life. Especially, it is noticeable that arson towards a large number of unspecified individuals can threaten public security because of its unpredictability. The preparedness from arson should set in with the prediction of the possible location that a criminal targets and the movement of minimizing the damage in case of arson. It requires government's role in supervising the arson criminals. It is important to acknowledge the risk of arson. For the preparedness from arson should make individuals equipped with ability to understand and cope with the risk of arson. We prepare ordinarily the structure of impact mitigation, emergency care, rescue and relief, the cultivation of ability to control the unexpected situation is more needed, change in social understanding of arson fire and the establishment of accurate statistic system. Corporation among agencies and establishment of the institution with overall charge in preparedness of arson fire. And we need education. The society, first, should take an effort to embrace the discriminated and weak members in response to the complexity and the diversity in the social trend. However, it is difficult to predict who the criminal is in case of arson that targets a large number of unspecified individuals. Therefore, the preparedness from arson should set in with the prediction of the possible location that a criminal targets and the movement of minimizing the damage in case of arson. It is difficult to predict who sets fire, however, there is high possibility that one can set fire again once he or she did. Therefore, it requires government's role in supervising the arson criminals. Moreover, it should bring up human resource to prevent arson by building a cooperative network among organizations and establishing the dedicated institution for the arson case. This will be applied to the arson control in the future and will establish a shared social thinking about the risk of arson through the statistics about the accurate result of close examination.

[Keywords] Disaster, Preparedness, Arson, Crisis, Emergency Management

1. Introduction

There are many chances of the outbreak of disaster in any kind as the structure of the modern society is complex because of its great economical boost, the extension of the industrial construction and increasing urban population. Among many artificial disasters, arson has

showed the gradual increase in frequency since 1980 and the size of the damage to the people and the property has been getting bigger. Arson derives from a pathological criminal behavior due to urbanization and industrialization at full speed, which many countries are already well aware of the seriousness of

damage from the arson and pay their attention to invent the method of prevention and the preparedness.

Arson threatens people's life. Especially, it is noticeable that arson towards a large number of unspecified individuals can threaten public security because of its unpredictability. Fire may bring enormous damage which cannot be estimated in advance because its characteristics does not allow to be controlled as one intended. Nevertheless, it is true that arson has not only obtained little attention constantly compared to other kind of artificial disasters but also succeeded little in experimental studies about arson in both cases: criminal and disaster. This reflects lack of awareness and concern in society about the seriousness of damage from the arson fire.

Therefore, this study arises from the awareness that it requires a study about the method of preparedness from arson in our society and the study will present the literature based approach provided with evidences and theses in both domestic and foreign cases.

2. Theoretical Discussions

2.1. The location of arson depending on the type of crisis

If we classify the crisis which is occurred in our society by accrual system, we can divide it two types of natural disaster and artificial disaster. Natural disaster gives an example of drought, floods, typhoon, a heavy snowfall and earthquake which is aroused by unusual natural phenomenon. On the contrary artificial disaster gives fire, explosion, radioactive contamination, communication network paralysis and building collapse which are aroused by human's indifference, carelessness and mistake.

If we classify it by a certain amount of time which we can recognize and response crisis outbreak. We can classify the unusual and immediate responding situation as exploding crisis. We can give an example as 9.11 U.S. Trade Center terror accident and Samping Department store collapse accident.

Meanwhile according to the outbreak factor we can classify it by natural, artificial and intentional, accidental, and then it is possible to classify it as violent and nonviolent. We can say that the fire by arson is belong to intentional and violent crisis

2.2. The stage of control crisis

The crisis control for the preparedness of disaster is generally divided four stages. We classify it pre-disaster stage and post-disaster stage on focus to disaster outbreak, and pre-disaster stage is subdivided prevention and mitigation stage and preparedness stage. Post-disaster stage is subdivided response stage and recovery stage. This process has mutual organic and circular relation rather than independence[1].

2.3. The theory of concentric circle

Ernest Burgess(1925) asserted that a city's developing shape shows Pattern of concentric Circles which city's characteristic activity drive into specific space location. He classify it as the 1st zone is Central zone, the 2nd zone is Transitional zone, the 3rd zone is Blue Collar residing zone, the 4th zone is Residential zone and the 5th zone is Commuter's Residential Area. Burgess asserted that the more you far away from city center, the higher land prices is. About the crime, the nearer the city center the higher the crime rate is. Also he asserted that ecological condition to make destroy the social control process exists especially in the 2nd zone and on the time to weakening the social control process deviation

activity come into view. Generally speaking industrialization and civilization cause to increase the collapse of social system, and the collapse of social system cause to decrease the traditional social control and make to increase deviation activity. Therefore the social policy focused on collapse theory of social system is to increase the social control power by reforming the town local community.

2.4. Anomie theory

2.4.1. Durkheim's anomie theory.

As Anomie means sociologically normlessness, it is called generally Anomie only to be conscious of the strong impulse about the human's target of success, without awareness of legality or illegality to achieve objective, namely the mental state to pursuit success target without distinguish right or wrong of means and method. When this mental state is to become generalization, the society is called anomic society. Anomie theory starts from social non-control theory of Emile Durkheim. Durkheim asserted that social non-control source is come from egoism and anomie[2].

2.4.2. Robert K merton's deviation theory

Merton said that the detachment between objective and means is related to social order, and men have naturally high fervent hope and learn the objective and means by studying. He classifies two basic element of composing social cultural structure as cultural set purpose and systematic norm. He regulate cultural set purpose is success target and systematic norm is lawful measure to arrive success objective. And as these two elements are composed independently rather than harmonious maintenance, there is some case that cultural set objective emphasis success target and the law-

ful measure to achieve objective is disregarded. Also lawful measures are not permitted equally to men for achievement of success. In case of this inconsistency and disproportion are severe; stress will be received for norm violation. It showed norm violation[3].

2.5. The previous studies about arson fire

Arson is to destroy by intentional fire on actual residential building, public building, general building or general things. Current criminal law punishes not only incendiary of narrow meaning but also obstruction of fire extinguish, destruction of explosive material, damaging the structure of gas. Therefore broad sense arson includes this quasi-arson. Patrick J Ralpelle(1978)[4] arned arson crime seriousness on the basis of damaging situation by arson crime in U.S. Also he pointed that policeman deliver completely the responsibility of arson fire to fire-fighter and fire fighter who did not train crime investigation are short of countermeasure power to incendiary. Therefore he stressed that cooperation between policeman and fire fighters are necessary. P. Anderson(1983)[5] pointed that Australia has social and economic expense damage by increasing more than 500% of arson crime last 10 years. In order to response against arson fire, it is necessary to cooperate with related authorities or people concerned, he emphasis on this time activity boundary as the recognition of arson fire of social community, education to improve concern level, elevation of inspective skill and preventive measure.

3. The General Characteristics of Arson Fire in Korea

The number of arson from 2003 to 2013 is like following

Table 1. The number of arson by year[6].

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
No.	1,713	1,590	1,827	1,685	1,694	1,749	1,876	1,891	1,985	1,881	1,738

Table 2. The number of crime from 1979 to 1998[7].

	Murder	Burglar	Rape	Arson
1979	458	1,315	3,621	361
1980	536	2,374	3,977	372
1981	625	2,504	4,568	428
1982	538	2,274	5,459	492
1983	518	2,498	5,244	464
1984	581	2,834	5,482	504
1985	600	3,135	5,453	476
1986	617	2,695	5,002	546
1987	653	3,102	5,034	553
1988	601	3,446	4,658	593

Table 3. The number of crime from 2003 to 2012[6].

	Murder	Burglar	Rape	Arson
2003	1,011	7,327	10,365	1,713
2004	1,082	5,762	11,105	1,590
2005	1,091	5,226	11,757	1,827
2006	1,064	4,684	13,573	1,685
2007	1,124	4,407	13,634	1,694
2008	1,120	4,827	15,094	1,946
2009	1,390	6,379	16,156	1,866
2010	1,262	4,395	19,939	1,886
2011	1,221	4,021	22,034	1,972
2012	1,029	2,643	21,346	1,897

On the past 10 year's index of 1980 age the number of arson criminal among violent crime are appeared to be the lowest. But 10 year's index of 2000 age arson criminal are jumped over murder crime and placed third deal of high weight. Arson occurring trend among total fire occurrence number and the gravity of arson among whole fire are increasing trend every year, 10 % sharing rate from 2003, a little decrease to 9% sharing rate on 2014. Especially from 2005 arson is continued sharing of fire factor following electric fire.

When we search the current situation of fire cause, arson and suspected arson are taken 8.5% of total cause of fire. But fire outbreak growth rate compared with previous year are appeared high as 81.2% of arson and 29.7% of suspected arson.

Also one noticeable point is that second conviction rate of arson criminal is very high. When we search the number of criminal record of arson, the ex-convict rates more than 4th criminal record are appeared high as 33.6% of total. Criminal ratio with arson ex-convict is showed 62.8%. This explained that political consideration is needed to prevent ex-convict of arson criminal. When we search criminal outbreak ratio in 2007, it was concentrated on large city, small and medium cities, On the occasion of arson it showed same as 46.9% of large city, 44.8% of small and medium cities. But arson in 2013, 45.1% of large city, 47.4% of small and medium cities. Moreover it is increasing small and medium cities.

Table 4. The number of arson compared with economy growth of Korea and Japan[8].

Year	Korea		Japan	
	National per capita income (USD)	Number of arson (%)	National per capita income (USD)	Number of arson (%)
1970	254	3.4	1,948	5.3
1975	602	3.4	4,492	6.2
1980	1,645	4.0	9,097	11.7
1985	2,309	5.6	11,275	14.0
1990	6,147	9.2	24,497	16.7
1995	11,432	8.1	41,959	18.0
2000	10,841	7.3	36,742	22.2
2005	16,413	10.3	35,565	21.3
2006	18,401	10.7	34,125	21.2

In case of our country, from the beginning to go over the national income to reach more than \$15,000, arson outbreak ratio begin to go over more than 10%. In case of Japan, as national income beginning to go over more than \$9,000 arson outbreak ratio begin to show more than 10%. Since then Japanese arson out-

break ratio shows more than 20% following from 2000 year which preserves \$30,000 of national income.

4. Recent Trend of Arson Fire

Even though there are some people who have dissatisfied, it is a point to be considered that the problem seriousness

of recent arson examples are appeared this social disbelief and anger to anti-social violence. This small meaning is the anger of him suffering unfairness, but large meaning is the terror against individual society of hopelessness. 'A large number of unspecified individuals' term itself is not a new term completely. 'A large number of unspecified individuals' in penal code are discussing on related to public(for example public danger crime like arson), public opening(for example defamation, contempt and obscene crime). It can be said that a majority opinion means to think this 'a large number' or 'unspecified individuals'. What is the reason why anti-social actions are increasing against a large number of unspecified individuals in recent days rather than past suppressed environment?

On the historic view, generally speaking, democracy goes through liberalization, equalization and solidarity. It is said that liberalization is the process that individual belong to group of blood ties, regional relation and prestige is to attain a freedom and independence from such nation and group. Such liberalization process bring a large gap according to environment and individual ability, the gap make class and cause complication. If such class complications get deepened, equalization is seeking at any form. But as this time's equality is generally legal equality, formal equality, and the confrontation between classes become more serious. Accordingly common rule and material foundation over the freedom and equality become necessary, like this common foundation building process is called solidarity.

The actual democratizing history of our country is 20 years, yet liberalization stage is primitive situation. Freedom gives individual qualification for personality identity, economy identity and policy identity[9]. The possession of freedom right is required strongly solitude of

responsibility. Passing by the time of sovereign loss by Japan, war, dictatorship, we become to extinct past tradition and economy progress rapidly. On liberalization stage, victims who are neglected and suffered denied this. Furthermore the liberalization process caused that family is rapidly to dissolve and district community is to collapse. Therefore mentally depended family and district society do not function to consolidate this people. Accordingly isolated men from liberalization extend their dissatisfaction and anger to hatred[10].

On the liberalization stage, growing stopped society which did not make progress of equality want to burn out negative reality through arson, and mighty force of existence is enjoyed to the full through the fact that their action have a large influence, On such meaning an arson to a large number of unspecified individuals is a response attack of social weak person[11].

5. What Do We Have to Do for the Preparedness of Arson?

5.1. The importance of disaster preparedness

Considering the characteristic of disaster's uncertainty, the prevention of disaster is really seemed to impossible. The over emphasis about danger prediction for disaster control cause to decrease the response ability of unpredicted accident, and on the time of accident occurrence, it amplified impact rather than prevention, it can be caused titanic effect to aggravate or weakening. Therefore as we prepare ordinarily the structure of impact mitigation, emergency care, rescue and relief, the cultivation of ability to control the unexpected situation is more needed[12].

Preparedness can be defined as developing activity of ability for crisis response on the time of crisis occurrence. On these

stage major resources is previously preserved for the practical application to response crisis on the time of crisis occurrence, and previous consent is to confirm from various crisis response corporations in or outside of crisis occurrence district. Also a series of activity get to be accomplished including reduce of the financial loss caused by crisis, training the response activist to protect inhabitant life, developing the prior crisis response plan, planning to manage the crisis or warning system and other way preparation.

In the mean time as we thought that arson is responsible for individual mental and psychological defect rather than considering the crime motivation of fire crime, the damage seriousness by arson was not dealt with social problem. On recent occurred fire incident, arson criminal carry out retaliation against social system and corporation. This is very dangerous because there is high possibility of occurring sufferers of a large number of unspecified individuals and high possibility of consecutive occurrence. Also

they do it deliberately and considerably in order to maximize the damage, as a result damage is appeared to be serious.

5.2. Change in social understanding of arson fire and the establishment of accurate statistic system

For the prevention and preparedness of arson it is necessary to set consciousness which social common response and preparedness is needed as well as arson is considered a challenging violence against district whole community. Dealing with many behaviors who act crime with strong dissatisfaction toward whole society, the arson criminal possess continuously the potential kindly which can be fired at any time and place. Accordingly it is easy to confirm the problem “Does any district to become a target of arson?” rather than “Who commit a criminal act.” It is necessary to demand strongly preventive policy against arson target district through accurate statistics of arson.

Table 5. A number of arson outbreak at multiple using facilities[9].

	House apt	Car	Factory	Res-tau-rant	Shop	Busi-ness place	Ware house	Hotel	School	Vessel	Market	Etc	Total
No of arson	957	1,078	82	118	200	36	37	42	24	4	8	827	3,413
%	28.04	31.59	2.40	3.46	5.86	1.05	1.08	1.23	0.70	0.12	0.23	24.23	100

In our country arson which is caused by the motivation of arson is managed, and suspected arson is handled separate way. This can be caused a dead zone to control arson and it effect to weak point to call attention about arson in whole society. On the occasion of U. S and Japan, the arson which is caused by the motivation of arson and suspected arson all together are dealt as incendiary fire on the management of statistics of fire outbreak.

As this can reduce an error to grasp the situation about fire criminal and can utilize exact data to response arson fire, the concern of society can be focused on it.

5.3. Corporation among agencies and establishment of the institution with overall charge in preparedness of arson fire

At present if a fire breaks out in our country caused by incendiary, we have a joint investigative system with policeman and fire-fighter together. but fire-fighter have dissatisfaction that the policeman lay preference criminal code rather than the Fire Service Act and take a hegemony to investigate even if they arrived lately[13].

In America the Arson Task Forces which is special team for only arson criminal was founded on since 1970[14]. Also The Fire Prevention and Control Act is amended in 1978 and did to guarantee of ample resource assistance to control arson criminal by adding now code called 'Federal Program to Combat Arson' in 1978. Through 'Federal Program to Combat Arson' to response arson criminal, The U. S. Fire Administration develop the seeking technique to arson criminal, and provide training and knowledge for preparedness against arson, and collect data about fire criminal. On the other hand they develop public education program about fire problem, program to develop nationwide data collection make up for complimentary execution in National fire Incident Reporting system. Also they develop supporting guide book to federal and state district public service personnel for the prevention and arrest against fire criminal.

U. S. tried to prevent arson fire through the activity of The Arson Task Forces which is instituted several cities and states. Japan founded the committee for fire prevention policy and executed a professional counter-measure research against arson. Fire-fighter, policeman, psychiatrist, psychologist and construction engineer are engaged in this fire prevention measure committee. Our country need to compose professional policy institute in order to develop prevention program against arson fire.

5.4. Education for prevention of arson fire

For the prevention of arson fire, it is necessary to educate about action guideline when a fire break out. On the occasion of arson fire break out in multiple using facilities, 1st responsibility for arson fire prevention is reversed to the central operating body but the damage can be minimized when action

guideline is trained and know thoroughly to a lot of people of come and go about prevention of fire. When arson fire break out in the subway it is difficult to access because staircase passage toward earth surface should take smokestack role. Therefore it is effective to achieve rescue activity and evacuation through railroad from both stations. The most efficient method of education is to announce users through screen or broadcasting such evacuation guideline.

6. Conclusion

The trend of arson damage is exposed to unspecified individuals and arson brings more damage to a larger number of public as a criminal gears up with more invented way.

The society, first, should take an effort to embrace the discriminated and weak members in response to the complexity and the diversity in the social trend. However, it is difficult to predict who the criminal is in case of arson that targets a large number of unspecified individuals. Therefore, the preparedness from arson should set in with the prediction of the possible location that a criminal targets and the movement of minimizing the damage in case of arson.

It is difficult to predict who sets fire, however, there is high possibility that one can set fire again once he or she did. Therefore, it requires government's role in supervising the arson criminals.

Moreover, it should bring up human resource to prevent arson by building a cooperative network among organizations and establishing the dedicated institution for the arson case. This will be applied to the arson control in the future and will establish a shared social thinking about the risk of arson through the statistics about the accurate result of close examination.

It is difficult to predict the damage of arson like any other disasters. Above all, it is important to acknowledge the risk of arson. Therefore, the preparedness from arson should make individuals equipped with ability to understand and cope with the risk of arson.

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Author

Cho Seong / Chungnam Institute Researcher

B.A. Chungbuk National University

M.A. Chungbuk National University

Research field

- How People Enter and Engage Zones of Acceptance in Emergency Management Contexts, Journal of Safety and Crisis Management, 5(1) (2015).
- A Comparative Analysis on Boat Sinking Disaster through a Core System Model -Seohae Ferry and Sewol Ferry Cases-, Crisisonomy, 12(3) (2016).

Major career

- 2009~2015. National Crisis & Emergency Management Research Institute, Researcher
- 2016~present. International Society for Disaster Management, Member

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Corresponding author
E-mail: yoojhj@cbnu.ac.kr

Peer reviewer
E-mail: editor@j-institute.jp

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A Study for RISK Communication Plans in a DISASTER Situation

Song Eu-gene¹

Chungbuk National University, Cheongju, Republic of Korea

Yoo Hyun-jung^{2*}

Chungbuk National University, Cheongju, Republic of Korea

Abstract

In today's modern society, risk applies to all people regardless of their social positions. Faced by a risk, the general public is exposed to various pieces of information about the risk intentionally or unintentionally and deals with it in various ways according to the risk information including eliminating and avoiding it. In a disaster situation, it is the best option to deliver the risk information to the general public in a fast and accurate manner, thus minimizing additional risky situations and preventing social confusion.

This study thus set out to search for risk communication plans for the government agencies to deliver the right risk information to the general public in an effective manner in a disaster situation by examining theories about risk communication and information. First, it is critical to provide the accurate information as fast as possible in a disaster situation. When inaccurate information is provided fast, it can have adverse effects on the risk management of general public, which means that a focus should be placed on accuracy rather than speed. In a disaster situation, people first get disaster information through various sources and develop a prejudice against risk based on the primary risk information that they are exposed to. Their prejudices are under the easy influence of past experiences, reference groups, and pioneers and their opinions regardless of risk. Second, it is necessary to manage information thoroughly when a warning message is delivered to the public in a disaster situation. Thorough management is required for warning messages spread via the press, Internet, and SNS. It also found that they would accept the information of warning messages regardless of their reliability, thus implying that rumor-like information with uncertain sources and grounds could result in huge social ramifications. Third, it is important to inform the general public of methods to cope with and manage a risk in a disaster situation through prognostic framing in case of risk communication so that their perception(anxiety) of objective and subjective risk can be put to rest. When risk communication continued to provide information through diagnostic framing, individuals would have excessive risk and anxiety awareness and thus cause a social amplification. It is important to inform the general public of methods to cope with and manage a risk in a disaster situation through prognostic framing so that their perception(anxiety) of objective and subjective risk can be put to rest. Finally, risk information should be delivered in a concise manner with a focus on the core content. When exposed to excessive information, common people get to experience fatigue about information and therefore undergo a judgment heuristic process to avoid useful information consciously. It is thus critical to deliver useful information to the general public in a concise manner.

When the general public deals with a risk in a proper fashion through effective risk communication, it can generate various positive effects including the reduced social confusion, cost savings, and image improvement as well as safe personal life.

[Keywords] Disaster, Risk Communication, Public Anxiety, Risk Information, Risk Information Acceptance

1. Introduction

Today there are a range of risks threatening the daily life of people including food, medicine, cosmetics, facility, and traffic risks regardless of the size. It takes long time to identify the causes of risks due to the scientific, technological, and social development. Sometimes the causes of risks are not certain. Such a situation makes the general public feel vague anxiety. The risk sociologist Beck[1] defined the modern society as a risk society and called risk the paradox of modernity. In the modern society, risk applies to everyone regardless of their social ranks.

Faced by a risk, the general public is exposed to various pieces of information about the risk intentionally or unintentionally and deals with it in various ways according to the risk information including eliminating and avoiding it. Such risk information is exposed to the public via diverse routes, which include the announcements of government agencies, experts' opinions in the concerned fields, and web pages containing common people's subjective opinions. Risk information delivered via such various routes has impacts on the many different ways that the general public deals with risk[2].

The government agencies, civic groups, and regular school education should consistently enlighten the general public about the risks in daily life through various social consumer education programs so that they will be able to cultivate their abilities to recognize, avoid, and eliminate the risks. In a disaster situation, however, it is the best option to deliver the risk information to the general public in a fast and accurate manner, thus minimizing additional risky situations and preventing social confusion. A good example is the social confusion derived from wrong risk communication in disaster situations such as the Sewol Ferry Disaster and Fukushima Nuclear Disaster.

The present study thus searched for risk communication plans for the government agencies to deliver the accurate risk information to the general public in a disaster situation.

2. Definition of Risk Communication

Risk communication involves delivering the information about the importance and significance of risk among the interest groups and exchanging information about the decisions, actions, and policies to control or manage risks[3]. The goals of risk communication are to influence individual users' decisions and thus reduce the risk of people[4].

There are diverse forms of risk communication including conversations between the doctors and their patients, safety education for employees at corporations, actions for the approval of a new plant facility between the corporation and the authorities, and the resistance of environmental groups against a new chemical factory. The major part of public risk communication is conveyed via the mass media[4]. Risk communication is thus quite a public and social act.

Being part of risk management, risk communication serves the role of delivering accurate information about the risks scattered around the society to the general public. In that sense, risk communication represents a process of each agency delivering information about the scope and nature of risk that concerns the public or members of the society[5].

3. The Frame of Risk Communication

Risk communication involves the acts of sending and receiving risk information in the form of message. There are two types of framing to convey such messages: diagnostic and prognostic framing. While the former focuses on defining the risk that has taken place and identifying its causes, the latter focuses on finding alternatives to overcome the risk situation and actions to take for that purpose[6][7].

4. Risk Information Acceptance

Consumer information acceptance refers to the degree of consumers accepting data that have been arranged to help with their problem-solving efforts[2].

Human beings have a limited capacity of information processing[8], which is why people make a decision to address an issue with a simple heuristic method instead of using as much information as possible to make an optimal decision.

The degree of information acceptance depends on information literacy as well as the capacity to process information. That is, there will be huge differences in the level of information acceptance and utilization according to individual capabilities even when the same information is provided to different consumers[9][10].

5. Conclusion

When there is a disaster situation, the general public gets the disaster information through a variety of sources including news, newspaper articles, Internet, and SNS. Different directions of risk communication or delivery of risk information result in different outcomes including people resuming their daily life fast and the unreliable government causing social ramifications such as large-sized demonstrations. The present study thus set out to examine the organization of risk communication and the acceptance of risk information and propose risk communication plans accordingly in a disaster situation.

First, it is critical to provide the accurate information as fast as possible in a disaster situation. When inaccurate information is provided fast, it can have adverse effects on the risk management of general public, which means that a focus should be placed on accuracy rather than speed. In a disaster situation, people first get disaster information through various sources and develop a prejudice against risk based on the primary risk information that they are exposed to. Their prejudices are under the easy influence of past experiences, reference groups, and pioneers and their opinions regardless of risk. When they have a strong prejudice, it can lead to mistrust in the risk management system and then an irrational attitude toward risk management[11].

Second, it is necessary to manage information thoroughly when a warning message is delivered to the public in a disaster situation. Thorough management is required for warning messages spread via the press, Internet, and SNS. Song[2] reported that there were two types of risk communication including relief and warning messages. Its findings also reported that when the public was exposed to relief messages, they would assess the reliability of the messages and accept only the ones with high reliability. It also found that they would accept the information of warning messages regardless of their reliability, thus implying that rumor-like information with uncertain sources and grounds could result in huge social ramifications.

Third, risk communication must be accompanied by prognostic framing. Kasperson et al[12]. reported that when risk communication continued to provide information through diagnostic framing, individuals would have excessive risk and anxiety awareness and thus cause a social amplification. It is important to inform the general public of methods to cope with and manage a risk in a disaster situation through prognostic framing so that their perception(anxiety) of objective and subjective risk can be put to rest.

Finally, risk information should be delivered in a concise manner with a focus on the core content. When exposed to excessive information, common people get to experience fatigue about information and therefore undergo a judgment heuristic process to avoid useful information consciously. It is thus critical to deliver useful information to the general public in a concise manner.

In a disaster situation, the opinions of government agencies, the press, and experts have huge influences on the general public. When the general public deals with a risk in a proper fashion through effective risk communication, it can generate various positive effects including the reduced social confusion, cost savings, and image improvement as well as safe personal life.

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Lead Author

Song Eu-gene / Consumer Analysis Center Chief Researcher

B.A. Chungbuk National University

M.A. Chungbuk National University

Ph.D. Chungbuk National University

Research field

- Development of the Consumers' Risk Information Acceptance and Reaction Measurement according to Risk Communication Types, *Crisisonomy*, 12(7) (2016).
- Effects Analysis of Optimistic Bias on Anxiety among Food Consumers, *Crisisonomy*, 12(2) (2016).

Major career

- 2007~present. National Crisis & Emergency Management Research Institute, Senior Researcher
- 2016~present. International Society for Disaster Management, Member

Corresponding Author

Yoo Hyun-jung / Chungbuk National University Professor

B.A. Sungkyunkwan University

M.A. Sungkyunkwan University

Ph.D. Sungkyunkwan University

Research field

- Development of the Consumers' Risk Information Acceptance and Reaction Measurement according to Risk Communication Types, *Crisisonomy*, 12(7) (2016).
- Effects Analysis of Optimistic Bias on Anxiety among Food Consumers, *Crisisonomy*, 12(2) (2016).

Major career

- 2012~2014. Crisis and Emergency Management: Theory and Praxis, Chief Editor
- 2013~present. Korean Society of Consumer Policy and Education, Chief Editor