A Study on Emergency Management Policy Triggered by The Crowd Crush in Itaewon, South Korea

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Abstract. On the evening of October 29, 2022, a large-scale crowd crush killing more than 150 people occurred in Itaewon, South Korea. It aroused the attention of the whole world. To prevent crowd crush and stabilize the social environment, improving existing emergency management policies is necessary. Analyzing the crowd crush in Itaewon, the author finds that due to the impact of the epidemic, people's psychology and behavior when going out in the post-epidemic era are different from those in the early years. Because of the absence of large-scale crowd crush accidents for a long time, people's safety awareness is very weak compared with the early years. And many rumors and bad information about crowd crush appeared on Korean social platforms, which brought bad impact on society and caused secondary injuries to survivors. At the same time, the South Korean government also suffers from problems like loose systems and insufficient prior preparation. Therefore, governments should strengthen the construction of emergency management systems, and refine emergency response plans in advance. Real-time dynamic monitoring can also be adapted to conduct real-time investigation of the flow and the density of people during a large-scale activity, so as to achieve early warning and timely action. It is also necessary to strengthen the construction of the network environment, promptly stop the spread of rumors and bad information, and do a good job of effectively refuting rumors and providing psychological treatment to disaster survivors.

Keywords: Crowd crush; risk prevention and control; public safety; large-scale events; emergency management.

1. Introduction

Recently, with the liberalization of epidemic prevention policies, large-scale group events have been held more and more, and the number of participants has also increased. Once there are mistakes in management and prevention and control in large-scale group activities, it is extremely easy to cause large-scale crowd crush accidents, bringing serious casualties and property losses. On the evening of October 29, 2022, a large-scale crowd crush occurred in Itaewon, Seoul, South Korea, killing more than 150 people. After this incident, how to prevent crowd crush accidents, how to carry out emergency management when crowd crush accidents occur, and how to carry out risk management and control afterwards have once again attracted the attention of safety practitioners. At the end of last year, China's epidemic prevention policies began to be gradually liberalized. People’s demand for going out and socializing exploded. Various tourist attractions and entertainment venues were full. In places such as St. Paul's Bus in Macau, there is often a phenomenon of excessive traffic density which is very prone to crowd crush accidents. In order to prevent crowd crush accidents similar to those in Itaewon in South Korea, it is necessary to analyze and improve existing emergency management policies to prevent problems before they occur.

After nearly three years of lockdown, people's psychology and behavior patterns have changed greatly. A large number of people travel has also brought a lot of pressure to public management around the world, so it is of great significance to check and fill the gaps in existing public management policies. In order to prevent crowd crush accidents and reduce the effect of injuries caused by accidents, this paper promotes the innovation of emergency management policies through the systematic analysis of crowd crush accidents in South Korea.

The existing research on crowd crush at home and abroad is relatively comprehensive. Different scholars analyze it from different angles: like the common causes of crowd crush exposed by the Shanghai Bund incident. They also analyzed the management concept, management method and management responsibility of large-scale group activities [1]. At the same time, researchers can also use the three classical models proposed by foreign scholars (three-stage model, four-stage life cycle model and five-stage model) to analyze each stage of crowd crush incidents and strengthen the management of the whole process of public safety incidents [2]. However, there are still shortcomings in existing research. Due to the impact of epidemic prevention and control, people often choose to go out a lot out of retaliation after the government announced the relaxation of the flow of people, resulting in ignoring some obvious safety issues, such as about the dense flow of people is very easy to lead to crowd crush accidents. People's awareness of safety is gradually weakening coupled with the fact that China has not had a crowd crush for a long time. And after the crowd crush in Itaewon, South Korea, games imitating the scene of the crowd crush appeared in the society, which shows that Korean society does not pay much attention to this incident, and it is easy to bring harm to survivors. On the surface, people's safety and travel psychology and behavior patterns in the post-pandemic era are very different from those of the early years. Under such circumstances, safety practitioners should analyze past cases and deficiencies in policies and combine effective emergency response plans at home and abroad to revise and improve the emergency management policy system and risk control plan, and strengthen the control policy of public opinion after the event to avoid adverse impact on society and secondary harm to survivors.

The author mainly analyzes and studies the existing scientific research results, relevant legal provisions and typical cases at home and abroad. Then the advanced ideas and policies in public safety and emergency management in some regions would be drawn on, by this the author could draw new views and improve the emergency management policy. So, the content analysis method and comparative analysis method are used for research.

This paper is divided into four parts, the first part will analyze the research background, research significance, and review the previous research; The second part will sort out the policy loopholes and lessons learned from the crowd crush in Itaewon, South Korea, as well as the post-incident measures and improvement plans; The third part will learn advanced experience and its significance for improving emergency management and risk prevention and control policies by analyzing relevant policies and related research at home and abroad. Part IV will provide recommendations for improvements and refinements to existing emergency management policies.

2. Analysis of Crowd Crush Accident in Itaewon, South Korea

2.1. The Course of the Incident

On the evening of October 29, local time in South Korea, Itaewon held Halloween activities again after three years after announcing the lifting of epidemic prevention policies and social restrictions in South Korea. At about 22:22 local time on October 29, a large number of people crowded into a narrow ramp about 4 meters wide in Itaewon, erupting into screams. At 22:24, the fire department received the first distress call, calling the police that someone was trapped in an alley in Itaewon and needed rescue. This is followed by a connection to a similar report. At about 22:40, the crowd fell like dominoes and was crushed five or six layers. About an hour later, 81 cases of breathing difficulties were reported. At 22:43, the fire department activated a first-level response to request the immediate suspension of Itaewon festival activities. Due to the Halloween event, the fire department on standby was dispatched as soon as possible, but because the crowd was too dense, it was difficult for ambulances to reach the scene of the accident. At 23:50, the fire department launched a three-level emergency response, dispatching a total of 848 people and 143 equipment to the scene of the incident.

At about 2:00 local time on October 30, the fire department released news that 59 people were killed in a crowd crush. At 6:00, the death toll rose to 149. At about 9:00, the fire department released

news that the death toll rose to 151, with 82 injured and 355 missing. At 9:45, South Korean President Yoon Seok-hyeol spoke about the crowd crush, declaring a period of national mourning and saying the government would begin processing compensation. At 14:00, the Seoul Metropolitan Government had received 3,580 reports of disappearances. At about 16:00, the death toll in the crowd crush in Itaewon in South Korea rose to 153, including 20 foreigners, and four Chinese citizens were killed in the accident.

As of 20:00 on November 1, the crowd crush in Itaewon in South Korea had caused 155 deaths and 152 injuries. At about 17:00, South Korea's Minister of Internal Affairs and Security and the Minister of Police bowed to the public to apologize for the accident. At about 20:00, the mayor of Seoul, South Korea, bowed in tears and apologized: he has unlimited responsibility for the Itaewon accident.

2.2. Analysis of the Causes of Accidents

2.2.1. Weak safety awareness of on-site personnel

Itaewon, which was once a favorite nightclub area for U.S. troops in Korea, has a strong western lifestyle. The festive atmosphere, coupled with the retaliatory psychology of going out brought about by the lifting of the epidemic, caused a large number of young people to gather there, and in order to satisfy their spiritual need to go out, they chose to ignore the safety risks posed by the large gathering of people. Some survivors said that there were even some self-centered people at the scene of the incident who instigated people around them to push forward and other actions, further worsening the order of the scene [3].

After the accident, when security personnel arrived at the scene of the accident and began to take emergency management measures and emergency evacuation, many people still refused to cooperate and chose to stay in place to rubberneck.

According to local media and eyewitnesses, although the Seoul Yongsan District Fire Department dispatched personnel and vehicles to the scene immediately after receiving the call, the evacuation was greatly hindered by the fact that it took 40 minutes for rescuers to arrive at the scene of the incident, due to the large number of onlookers who were stranded.

2.2.2. Emergency management systems are loose and ill-prepared

In an emergency, the crowd crush has gone through four stages: free movement of the crowd, stranding, crowding and crowd crush. It means that before the crowd crush there is still reaction time. But in the crowd crush in Itaewon, South Korea, the police have not yet clarified the definition of responsibility for such activities and the response plan, which has caused a delay in response to a certain extent.

According to media reports, people at the scene called the police a few minutes before the crowd crush to warn, but the police did not deal with it seriously, so that they didn't take any contingency measures until 22:40. After the crowd crush occurred, the relevant departments rushed to take emergency management measures, missing the optimal evacuation time.

In addition, according to Yonhap News Agency and Professor Park Jae-seung of the Department of Fire and Disaster Prevention at Chongsil Internet University in South Korea, although on October 27 the "Halloween Emergency Response Response Countermeasures Meeting" was held in Yongsan-gu, where Itaewon-dong is located, the discussion of safety management measures for large-scale crowd gatherings was not carried out. Instead, the focus was on epidemic prevention measures and whether the on-site facilities were safe to operate, which leads to inadequate preparation [4]. At the same time, the local government did not formulate emergency plans for activities in advance, resulting in the lack of on-site safety management plans.

2.2.3. The government neglected that this place was not suitable for large-scale events

Video from the scene showed that the crowd crush occurred in a narrow alley next to the Hamilton Hotel in the heart of Itaewon-dong. The alley is a typical terrain where "crowds are difficult to evacuate". If the personnel at the bottom of the ramp fail to dodge in time, it is likely to be squeezed

and pushed down. Besides, if the fallen personnel do not stand up in time or attract the attention of others, it is very likely that a series of crowd crushes are not only narrow and sloped, but also uneven ground, easy to trip pedestrians. Bars and clubs are also placed next to the laneway to add to the festive atmosphere, attract customers and attract the attention of pedestrians, such as Halloween-style pumpkins, etc., which also crowd the limited passage width of the laneway [5]. If the government can know this information in advance, then they should be able to know in advance that a crowd crush may occur and put in place emergency management measures or just host this event in different place.

2.3. Post-incident Corrective Measures

After the Itaewon crowd crush, South Korea announced a series of crowd management measures. For example, in cities with a population of more than 500,000, sudden increases in the crowd in subway stations should be guarded against. When someone is concerned that the density of people in the subway station is dangerous, an alarm is raised [6]. In addition, the South Korean government will give police and firefighters greater authority to be more proactive in responding to accidents. The South Korean government also revealed that it will add courses on handling emergencies, such as cardiopulmonary resuscitation methods, to the national education curriculum, strengthen practical training for students, and teach preschoolers to stay away from overcrowded areas. The Seoul government said after the incident that it would hire experts to conduct a hazard analysis of some crowded subway stations and develop preventive plans to provide safety facilities for passengers, identify evacuation areas and install surveillance cameras.

3. Advanced Public Safety Management System

3.1. Saudi Arabia

After the crowd crush in Mecca, the Saudi government cooperated with high-tech company Crowd Vision to use on-site crowd analysis software to warn the flow of people in real time, which eased the momentum of frequent crowd crushes to some extent. The software provides real-time, accurate data on crowd size, density, distribution, and flow. Then the data would be transmitted to a large operations room where military, police, and other managers could analyze it and uncover patterns of crowd behavior that signal potential danger, such as high density, stress, stop-and-go crowds, and other anomalies. The software system has been available in Mecca since 2007 and plays a role in the Hajj every year. After the crowd crush in 2015, the Saudi government announced in 2016 that it would provide electronic identification bracelets to all Muslims traveling to Mecca for the Hajj. The bracelet is waterproof and connects to GPS to guide pilgrims in choosing prayer times. Most importantly, it contains personal and medical information that helps the government provide medical care and identification to wounded and sick pilgrims.

3.2. Japan

In November 2015, the Japanese Diet amended the Garrison Business Act and the Rules of the National Public Safety Commission to add a full-time "miscellaneous guard" to the police category, namely crowd security guard, in addition to permanent security and traffic guidance guard. Since then, as long as it is a crowd gathering occasion, such as fireworks festivals, outdoor gatherings, sports competitions and other crowd gatherings, there will be miscellaneous guards to guide and command, ensure that the walking passage is unblocked, and alleviate the crowd density. Correspondingly, in addition to adding dense guards to major activity venues, local police stations have also set up new psychological induction units, known as "DJ police," by the outside world, whose responsibility is to channel people's anxiety through radio and other means in noisy areas with a large number of people, guide people to obey traffic commands, and avoid crowding and crowd crush incidents.

3.3. United States

The Federal Emergency Management Agency (FEMA) is the crisis management responsible agency of the U.S. government. In 2005, the Department developed the Emergency Planning Guidelines for Special Situations that are comprehensive and provide actionable recommendations. FEMA's Emergency Management Institute (EMI) educates public officials such as civil servants, firefighters and police officers throughout the United States and requires familiarity with the guidelines. To prevent crowd crush, the U.S. government uses the guidelines as a safety guideline at major events. Specifically, the guidelines focus on maintaining "appropriate audience density", stipulating that at least 0.3~0.5 square meters of space per person is required for outdoor activities without designated seats; if more than 2 to 3 people gather per square meter, the authorities should take relevant measures in advance. The guidelines also stipulate that if large crowd gatherings are expected, it is necessary for the authorities to divide places where people gather or set up roadblocks to appropriately separate the space; In order to prevent crowding, it is necessary to check in advance whether the site has the necessary emergency space for rescue work, etc. According to this guideline, when there is an excessive concentration of people in an area, the authorities will set up roadblocks everywhere to prevent further congestion; At the same time, there will be space between places divided by barricades. This can limit the movement of people to some extent and prevent the flow of people from rushing to one side quickly. In 2013, the U.S. Department of Justice's Bureau of Legal Assistance published Guidelines for Managing Large Populations and Events that federal and local government authorities can refer to. The guidelines state: "Authorities should set a maximum number of people participating in a particular event during the development of a security plan for a particular event. In particular, the age and gender of the participants should also be taken into account. It also points to the need for more medical facilities for children and the elderly, as they are more vulnerable to injury than adolescents and adults.

4. Proposals

4.1. Public Opinion Control

At the Korean social level, after the Itaewon crowd crush accident, there was a phenomenon of students imitating the Itaewon crowd crush, which is easy to bring adverse effects to society and cause secondary harm to survivors. At the same time, there are also a large number of rumors on the Internet about the cause of the crowd crush in Itaewon, such as "people suddenly gather to see the stars", which has brought a very bad impact on social security.

Therefore, government departments should pay attention to the control of public opinion and provide a good external environment for effective public management and maintenance of social order by the government in emergencies.

First of all, government authorities actively disclose information at the first time. Rumors generally breed with the occurrence of emergencies, so government departments should actively disclose relevant information as soon as rumors breed to reduce the opportunities and possibilities of rumor spreading [7]. Secondly, in the process of debunking rumors, the government should achieve "pictures and truth", as detailed and specific as possible to present the information it has to the audience in a three-dimensional and comprehensive way, especially the use of pictures, videos, links, primitive verification and other forms to refute rumors, so as to improve the persuasiveness and credibility of the rumor-refuting information, so as to arouse the audience's strong visual stimulation and spiritual resonance in a short time, so that the rumor-refuting information can play a multiplier effect in dissemination and audience acceptance. Finally, improve citizens' rational thinking ability to objectively examine online rumors. Rational civic education and the cultivation of rational critical thinking are long-term ways to minimize online rumors.

At the same time, the government should strengthen the supervision of the online environment by using intelligent algorithms or artificial intelligence to control public opinion on social media.

Regulatory authorities could also use some software like keyword recognition to promptly delete and refute bad information or rumors. Besides, Penalties should be increased to ban and fine accounts that publish rumors or bad remarks online. In addition, a psychological counseling platform should be set up on the network. By using algorithms to identify speeches containing anxiety, panic and other bad emotions on the network, the platform could give timely psychological intervention and counseling to speakers, so that it can prevent them from self-harm or even suicide.

4.2. Emerging Technologies Detect Foot Traffic and Early Warnings

Nowadays, many countries have adopted AI algorithms to simulate the emergency evacuation of large-scale event venues in advance and use real-time dynamic monitoring software to detect the density of people flow at large-scale event sites, so as to achieve early warning and real-time action [8].

For example, the well-known emergency evacuation simulation pathfinder can use geometric model code to make a variety of buildings and scenes, and then import the A-star algorithm to divide the space into 0.4×0.4 meshes, each grid can only have one person. It is convenient to simulate the movement of people in the building. At the same time, the social force model is used to simulate the self-driven, psychosocial and physical forces of personnel, and then the result could be used to divide the activity space and plan the path, which is used to judge the safe evacuation of the activity site [9]. The software can be used to simulate the evacuation of the place where a large-scale event will be held in advance, so as to determine whether the environmental layout of the place is reasonable, whether the passage is too narrow, how many security personnel should be equipped on the site and how to effectively evacuate the crowd, etc., to help the government department determine whether there is a risk of crowd crush in the area, and assist the relevant departments to formulate emergency plans.

In addition, real-time dynamic monitoring functions can also be introduced into the on-site surveillance camera, so as to obtain the location coordinates, posture information and initial speed of Penalties personnel in the area from the monitoring screen, so as to achieve real-time dynamic monitoring and simulation, and at the same time calculate the force between people at the entrance or passage, predict whether a crowd crush will occur after a certain period of time, and timely notify the relevant departments and on-site security personnel of the prediction results so that the corresponding measures in the plan can be taken in time [10].

4.3. Improve the Emergency Management System and Risk Awareness of Relevant Departments

To improve the emergency management system of government departments, the government should first determine the competent departments and approval departments that hold large-scale activities, clarify the responsibilities of each department to prevent and respond to crowd crush accidents, make full use of the response time before crowd crush occurs, ensure that prevention and monitoring are possible, and promote the transformation of crowd crush emergency management from post-rescue to pre-prevention [11].

Strengthening risk awareness is a subjective condition for urban public safety governance. In order to effectively pre-control risks, the government must strategically strengthen risk awareness, and the concept and mechanism of risk pre-control should become the pre-decision-making elements for the occurrence of government administrative actions. The concept and mechanism of risk pre-control help to avoid emergency managers falling into the shackles of inertial thinking, timely discover emerging and trending problems, and better respond to "black swan" and "gray rhino" events.

In addition, government departments also need to strengthen the crisis learning of international and regional public emergencies and improve their sensitivity and pre-control level of risk analysis and judgment in the process of crisis learning.

5. Conclusion

This paper concludes that the main reasons for the crowd crush in Itaewon are the weak safety awareness of on-site personnel, the loose emergency management system, and the lack of prior preparation due to the government's neglect of the terrain and topography. These problems have exposed the shortcomings and shortcomings of the Korean government in public safety emergency management and have also sounded the alarm for countries around the world, reminding governments to improve their emergency management policies.

This paper also studies the emergency management policies of Saudi Arabia, Japan, and the United States. Learning advanced experience from them and combining the Korean government's post-incident corrective measures, the author thought that emergency management systems and risk control policies can be improved by three aspects: public opinion, technology, and management system. Therefore, it is urgent to attach importance to the modernization of urban emergency governance system and emergency response capacity and promote the improvement of urban safety resilience. In this regard, it is necessary to improve crowd density monitoring and early warning. It is also essential to strengthen emergency response and accident aftermath according to the characteristics of crowd flow and gathering in public places. Then government should vigorously promote the modernization of urban public safety governance system and governance capacity, and help the construction of safe cities.

However, there are certain shortcomings in this study, it is impossible for the author to conduct field investigations due to the impact of the epidemic, and the information on relevant foreign policies found online is limited so that there are certain limitations. The author hopes that there will be opportunities to conduct field visits to various countries in the future, and at the same time obtains more relevant information to further improve the improvement proposals for emergency management and risk control policies.

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