The Role of the Humanitarian Logistics in the Kiss Nightclub Case

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Abstract

The aim of this paper was to conduct a descriptive study of the Kiss nightclub fire associated to a literature review in order to synthesize data regarding the logistics employed in the mass disaster management. A discussion comparing the scientific evidence and data from the Kiss nightclub case is presented. This paper focuses on the following aspects: role and importance of the media, management of donations, and coordination of the humanitarian logistics. In the case herein analyzed, the humanitarian response was considered adequate, especially in the survivors' care. An efficient coordination strategy was adopted, and the media played a vital role requesting blood donations. Further research and case studies in the area of logistics are needed to achieve more effective responses in mass disasters.

Keywords

1. Introduction

On the night of January 27, 2013, a fire at the Kiss nightclub in Santa Maria, state of Rio Grande Sul, resulted in 242 deaths and other 145 people hospitalized and included Brazil to the global record of mass fire disasters. The incident received international attention due to the high number of fatalities, the young age of the victims, and the worldwide common scenery. The case also drew attention for the immediate response and strategies adopted after the disaster. The response of the government authorities was immediate, and many volunteers provided assistance on several strategic fronts [1].

There are several definitions for disaster and the context in which this term is applied is relative, since it depends on the local structure and capacity for recovery. Disaster can be defined as the situation which exceeds the capacity of response and recovery in a sudden event that affects a place and a population, causing several disorders [2]. In this context, humanitarian logistics is understood as all processes involving planning and managing human and material resources in order to aid the population afflicted in cases of disasters [3]. Its main challenges include proper coordination, decision-making regarding accumulation, quantities, storage, and distribution of supplies, and coordinated actions with the media [4].

The role of the media intervention in a disaster response is directly proportional to the number of donations, *i.e.* the greater the media attention in a disaster, the greater the civilian contribution. However, as this attention tends to decline in the medium and long-term, the number of donations also suffers a substantial reduction. In addition, the media is essential to plea for professionals from different backgrounds to assist in the victims care and recovery of the affected area [5] [6]. In addition to the volunteers, a disaster requires the involvement of several professional teams and institutions. In order to result in effective actions, such taskforce demands synergy and cooperation among the groups, as well as adequate coordination [7]. The study of mass disaster events and the critical analysis of the procedures adopted are essential to elaborate a protocol of action that may help eventual future accidents with similar characteristics and, more importantly, to alert to the priority of prevention so that "man-made" disasters become more unlikely.

The aim of this study was to conduct a descriptive study of the Kiss nightclub fire associated to a literature review of mass disasters response using peer-reviewed articles, reports of people that lived the event, and online media reports. In order to elucidate some critical points and contribute to make the logistic response more efficient, the article focused on the importance of the media, the management of donations, and the coordination of the taskforce. Section 2 of this article presents a literature review outlining the perspective of humanitarian logistics in disasters and highlighting the influence of the media, the management of donations, and the importance of proper coordination. In Section 3, the approach adopted in the methodology of the study is described. In Section 4, a discussion comparing the scientific evidence and data from the Kiss nightclub case is presented. Finally, the conclusions are pointed out in Section 5.

2. Literature Review

The humanitarian logistics main goal is the planning and management of the mitigation of mass disaster cases in order to save lives and provide proper assistance to the victims. Thus, the application of humanitarian logistic principles is vital in catastrophic events, especially due to the urgent care required by those affected. A substantial challenge to the logistic disaster response is the significant

number of uncertainties that may be involved in the incident such as the total number of victims, the existence of adequate communication strategies, and the local capacity for immediate response. Mass disasters often result in severe consequences for the geographic area and the local population, including material, human and economic losses. The negative effects tend to be maximized when preventive strategies and action programs have not been previously outlined and implemented. Locations that host large audiences require the existence of an adequate number of escape routes, passageways and wide openings for rapid exit in cases of evacuation, as well as a planned guidance system with signs, arrows, audible warnings and visual information, which may contribute to reduce panic in the public [8].

Mass disasters are categorized according its main cause, natural or man-made, and its timing, slow onset or sudden onset. It is recognized that sudden onset events tend to receive more media attention [9]. Considering that emergency situations may arise or be caused by natural phenomena or as a result of human actions, it is essential the study and knowledge of the local space accessibility, alert systems, and rapid and safe circulation and escape routes [10].

The role and importance of the media

The media has a particularly relevant role in cases of disaster, especially in terms of the speed of dissemination and reach of news. This rapid dissemination of information might produce positive outcomes; however, in some cases, the circulation of fake, erroneous, or misleading information may lead to the worsening of the scenario [5] [11].

Establishing strategies of communication is vital to foster cooperation with the media and to encourage the communication groups to act in favor of the humanitarian logistic response. Ideally, it would involve the creation of an information center solely responsible for producing and sharing news about the disaster, avoiding sensationalism and speculation [12].

Furthermore, communication and information technologies are effective tools for the mobilization of collective actions. Some common characteristics regarding the action of the media in mass disasters include the central role of the communication to the organization and mobilization of volunteers, professionals and donations, and the content production conducted by the population itself through social media, which fosters the community empowerment by using the online social networks as a space of counter-power [13].

In mass disaster events, the media functions as an active actor by transmitting relevant information to the population. The role of media before, during and after a disaster is essential to ensure the safety and integrity of the people, as well as the care and assistance needed by those affected. Likewise, the government press office, as an official body, should coordinate and organize the data and information relevant to media access, which will then bring the matter to the community. The success of such intricate communication process requires strategy and planning since the prevention phase, currently the main line of ac-

tion of Civil Defense agencies, to the stages that involve logistic response and reconstruction [14].

One major advantage of using digital media formats is the interactivity and the instantaneous exchange of information and content. The strengthening of relationships through chats and messages, the possibility of contacting new people, and the promotion of collective interventions through social mobilization are also important features which have contributed to digital medias become a significant part of peoples' daily lives [15]. Barreto highlight that there has been a great increase in the reach of online media in recent years, including among the elderly and rural residents, which contributes to the dissemination of information in an effective and rapid manner [11]. These mechanisms of disseminating instantaneous information are capable of giving voice to a greater number of people at the same time, in addition to stimulating donations through public sensitization campaigns. On the other hand, online medias may become the source of fake, erroneous, or misleading information, or even encourage an excessive number of donations, causing a problem of management [15].

Management of supplies

The management of donations is an important and relevant aspect of the logistics of disaster response, since there is a need for immediate provisions. Donations are usually the most convenient way of meeting needs in events with large and uncertain demands [16].

The concept of humanitarian logistics emerges from the need to attend to these types of emergency situations. It proposes the effective use of logistic concepts adapted to the specificities of the humanitarian relief chain. The application of a methodology of distribution of the chain of supply, including the determination of the location of intermediate distribution centers for storage of donations and future destination, is essential [17].

For this end, the structure of the relief chain and the concept of intermediate distribution centers developed by Balcik may be applied. These models recommend, firstly, the acquisition of supplies through local or global donations, either monetary or material, or from public policies and government agencies. In the next phase, the screening of the donations deserves attention due to the randomness of the received items, which could result in excessive number of some materials and scarcity of others. Screening the donations prevents the unnecessary transportation to distribution centers of items that are not essential at the moment, as well as the use of storage spaces and potential double-work, which could be detrimental to the success of the logistic response, considering that time is a crucial factor in these operations. The supplies are transported to the distribution centers, where the materials screened in the first moment will be stored, organized and catalogued in order to be sequentially delivered to the intermediate centers and distribution points. The transportation phase might be considered a challenge for the authorities. The assessment of the need to rent vehicles, the study of the geographic characteristics of the affected site, and information

on the actual conditions of the roads are mandatory factors for the successful execution of this activity [4].

The agility of the management of supplies is understood as the ability to respond quickly and properly to short-term changes in demand. This process is sustained by flexibility, responsiveness, and effectiveness of the supply chain [18].

The number of people injured is usually large in cases of sudden disasters, which can surpass the capacity of blood centers and, as a result, increase the need for blood transfusions. In these cases, the response strategy is varied, depending mainly on the characteristics of the event. Yet, the centralization of donation management is recommended since it provides greater control of the actual blood transfusions demand and facilitates decision-making and the distribution of supplies to the hospitals, which aids in the logistic response and prevent duplicate work [19].

On the other hand, Kuruppu describes as a sensitive issue created by excessive blood donations the increased risk of cross infections. Most of the blood donations in situations of disasters are conducted for the first time. Additionally, professionals are often fatigued due to long shifts of work, which may lead to less thorough examinations. In the ideal scenario, as a prevention strategy, the blood bank should maintain a supply sufficient to attend the situational demand for at least seven days. In the event of a disaster, the proximity to the end of the blood reserve should be notified in order to attract new donors. The demand must be adjusted to the actual need. The recruitment of new donors is essential in cases where the demand for blood transfusions exceeds the reserve capacity of blood banks. Safety protocols and eligibility criteria must be applied with rigor to guarantee the safety and quality of the blood, protecting the donor, the recipient and health teams [20].

Adequate blood supply management is particularly important in the first few weeks when the number of volunteer donors is higher due to the uncoordinated appeal and influence of the media [19]. The process involves assessing the actual need for blood transfusions, distribution of the blood to locations in need, and making the supply chain of blood banks more efficient [21].

Coordination of the humanitarian logistics

Balcik defines coordination as the interaction between the social actors involved in an event, which can occur mainly at three levels: strategic (long-term), tactical (medium-term) and operational (daily operation) [4]. Coordination is mainly responsible for the distributions of tasks, sharing of information and decision-making. It is an essential mechanism for an efficient and effective response [22].

The high number of actors at a disaster site is one of the great challenges of coordination. Even when the taskforce is well conducted and all the different teams share the same goals such as saving lives and alleviating suffering, the high flow of personnel and materials, in many cases, become difficult to control [4].

In a disaster, the decision making process should be coordinated by those individuals best trained and experienced [1].

In disaster events, synergic coordination among the authorities involved during decision-making is essential, avoiding underutilization of response capacity. Humanitarian logistics should contribute effectively to disaster relief, being recognized through the implementation of initiatives in the areas of knowledge management, technology, communication, and planning [3]. Wettenhall states that in cases of disaster, it is necessary to deal with the unpredictability of demand, need of immediate response, and lack of adequate physical structure. This requires optimal organization in order to maximize positive outcomes and mitigate difficulties related to the delivery of proper care. A coherent strategy aligning those involved is very often needed [23].

The adequate response to mass disasters depends on the efficiency of actions and must be quick and effective in mitigating the suffering and risks of the victims. The humanitarian logistics is one of the main areas of responsibility for this response [24]. When part of a crowd, individuals tend to assume a collective behavior known as "flocking". It may lead to disastrous consequences in case of general panic. Under normal conditions, the individual decision-making process weighs the advantages and disadvantages of each choice and action. In situations of terror, on the other hand, people try to move faster and act quickly, which often leads to greater difficulty of control and coordination [8].

A multicriteria decision analysis can be applied to the humanitarian context of disaster response, enabling the creation and evaluation of strategies to draw up a cargo delivery plan consistent with the management principles. Based on the identification of the causal relationship between pairs of objectives, a network containing all the elements pertinent to the planning task may be constructed [25].

Previous training for institutions, government agencies and the general public on disaster preparedness and response is essential to achieve improved coordination and management in cases of mass disasters. One of the aspects identified as a complicating factor in the response to fire accidents is related to the management of volunteers and the coordination of the many institutions involved in the scene. Developing a disaster response plan, regularly delivering preparation training, and fostering appropriate coordination tactics contribute to the effectivity of the logistic actions in eventual future disasters [1].

3. Methods

A review of the literature was performed in Pubmed, Bireme, BVS, Lilacs, and Google Scholar databases, using as search strategy the combination of following terms: "Kiss nightclub", "disaster", "fire", "social media", and "supply chain". To reflect contemporary evidence, articles published between 2008 and 2018 were considered. The retrieved articles were screened based on the relevance to the topic assessed. Selected articles were then included in data extraction sheet de-

veloped in Microsoft Excel® 2010 according to the proximity to the central theme. Selected articles were full-text read and critically analyzed.

Media reports and information available on online formats focusing on the logistic response to the Kiss nightclub disaster, reports of survivors and management of donations were searched and considered in this paper. After the synthesis of the data gathered, a discussion was elaborated confronting the evidence on the logistic response to mass disasters and the information available in the online media regarding the Kiss nightclub case. The discussion focused on the role and importance of the media, the management of donations, and the coordination of the humanitarian logistics, contributing to identify barriers and facilitators to the adequate management of similar mass disaster cases.

4. Discussion

On the Kiss nightclub fire, in the city of Santa Maria, a total of 242 people died and 145 were hospitalized. Eight people died after receiving initial care. Other 623 people remained in treatment after the incident. The primary cause of death was asphyxia by cyanide and carbon monoxide released from the combustion of the polyurethane foam, a material inappropriately placed as a ceiling coating [1]. According to the technical inspection, the fire was initiated by the action of an igneous body in contact with a flammable material. An incandescent fragment expelled by a pyrotechnic device reached the polyurethane foam coating above the stage and the air conditioning duct. In addition to the presence of highly flammable material adhered to the ceiling and the air conditioning, the ceiling tiles did not present a perfect juxtaposition, allowing the lodging of the igneous body.

The fire started around 3 o'clock in the morning. The military police were the first to arrive on the scene, followed by the state fire department, by public ambulances of Pre-Hospital Mobile Assistance (SAMU), and ambulances of private institutions that were specially assigned for the event. The available emergency equipment, coupled with a significant number of individuals attempting to assist in the rescue of the victims, was not sufficient to attend such large-size incident. Shortly after the fire outbreak, many institutions and authorities had already arrived at the scene, including federal and state highway polices, fire trucks, military police and civil guards, as well as various taxis and private vehicles. The lack of physical delimitation obstructed the access of ambulances to the central area of the disaster and hampered the allocation of places for the initial screening of patients. Some victims were transported to the hospitals in the car seats or on the floor of vehicles, completely unassisted. Deceased victims were sent to hospitals while those who needed immediate care waited for proper aid. The chaos was amplified by hundreds of young people in panic trying to escape alive from the scene [1].

The overcrowding of people attending the event, in association with the difficulty to identify and access the emergency exits of the venue, contributed to the

large number of deaths. Approximately 1061 people were present at the venue at the moment of the fire, 370 people above the nightclub capacity.

In addition to insufficient material and human resources to manage a disaster of such magnitude, there were several barriers to the effective isolation of the site. The institutions included in the response to the tragedy faced a major obstacle: young people who had already left the fire alive, friends, relatives, and people passing by insistently tried to return to the scene of the fire intending to find their kin. With a limited number of professionals, properly addressing the coordination of teams, the evacuation of neighboring buildings, and ensuring safety during operations became a substantial challenge, virtually impossible to overcome. A command center was established at the Astrogildo de Azevedo Charity Hospital (HCAA) in Santa Maria responsible for recruiting human resources, managing and acquiring medical supplies, and referring the victims to proper care. Severe patients remained in the two largest hospitals in Santa Maria, whereas the most stable cases were referred to smaller hospitals in the city or region. The command center also organized work shifts in order to the volunteer health professionals escort the patients during the dislocation [1].

Five helicopters and two airplanes were used to transport 32 patients in critical conditions. In this case, the use of air transportation was of great importance for the agility in the provision of appropriate care. The use of helicopters in the phases of distribution, reallocation, and humanitarian aid is a resource of great importance which should be included in a system of disaster management [26]. With the increasing number of victims arriving to the hospitals, the substantial demand for care required optimal organization and focus on the logistics of patient care and transportation. A doctor involved in the victims' aid reported to an online media agency:

> "[...] Creating a command center for health teams not to get lost and disorganized was also critical. The lesson that remains is: you will not be able to do everything, you have to concentrate on what you do; if you are on charge, you command, and do not assist the patient, while those assisting the victims do not try to command. The lesson is the organizational matter. Focus on your abilities, put yourself in a place where you have a higher level of excellence and stay there [...]."

The community mobilization in response to the tragedy occurred in several fronts, including rescue aid, victim identification, psychological support to families, provision of water and food to volunteers and relatives of the victims, information on blood donations, and lists of victims [13].

Communication with families and victim identification was conducted at the City Sports Center, which was designated as a disposal site for the corpses. Professionals teams comprised of physicians and psychologists played a crucial role in assisting the victims' relatives who attended the site. The determination of the mortis caused by the technical inspection was also concluded at the location. At the same time, the press and online social media uninterruptedly reported in-

formation, mostly speculative, about the likely cause of the fire, the state of the survivors, and the number of victims. Initially, each hospital designated a team responsible for collaborating with the press, but the federal government later assumed the role in order to achieve greater coordination. As the centralization of information did not occur immediately after the fire, it may have contributed to the dissemination of misinformation regarding the number of victims [1].

The use of the internet as a vehicle of information enabled the propagation of news in "real time". Immediately after the incident, civilians began using their online networks as a space with potential for organizing actions and circulating information. For instance, an online-based group called "SM Volunteers" was created in order to organize and concentrate information, phone calls and work shifts for volunteers in the city hospitals. Other online organizations were created to follow criminal investigations and to promote tributes to the victims. A Facebook page was created to offer accommodation for the families of victims which lived in other regions of the state. Twitter accounts were used to contact the relatives of hospitalized victims who had not been reached by the hospitals [11].

In less than 24 hours, the disaster became the main topic broadcasted by the media in the entire country. Nationwide mobilizations became frequent in the form of marches, protests and denunciations of other venues with poor safety conditions. In the tragedy instantaneously reproduced by an omnipresent media, many exemplary actions such as food collection and appeal for blood donations became viable due to the reach of online social networks.

As the initial chaotic situation was mitigated, the media started to shift their focus to campaigns for blood donations. Information on blood banks locations and hours were continuously broadcasted [27]. Blood banks of several cities of the state, including in the capital Porto Alegre, were at capacity as a result of the overwhelming attendance of blood donor. Although the clinics extended their working hours due to the massive response, it was not sufficient to attend all the volunteers. Therefore, managers urged donors to schedule blood donation and maintain the willingness to donate over the next few days, a period that usually suffers a drop in the number of blood donation [26]. The repercussions of the disaster raised the population awareness regarding the need to intensify the surveillance of similar venues. Anonymous denunciations were encouraged by the online social medias. Discussions regarding safety in nightclubs, use of pyrotechnic devices in enclosed spaces, and the aptitude of the authorities responsible for attesting the safety of the venue were triggered since the disaster [27].

Prior to the fire, there was no disaster response plan in the city, nor any previous training for such situations. These actions are the first steps in improving mass-accident responses. Still, the rescue teams and volunteers work were successful in mitigating the some of the negative effects of the disaster. The potential mortality risks of the incident were significantly reduced due to the immediate life support delivered to a great number of victims. Table 1 summarizes the

Table 1. Comparison of the Kiss nightclub case main elements to logistics literature.

Kiss nightclub fire Santa Maria, January 27, 2013	Logistics literature
Approximately 1061 people attended the venue, 370 above the nightclub capacity. The large number of people, associated with the difficulty of identifying and accessing the exits, aggravated the scene.	Locations that host large audiences require an adequate number of routes, passageways and wide openings for rapid exit, as well as a planned information and guidance system with signs, arrows, audible warnings, and prior information indicating routes and exits and preventing general panic [8].
Difficult access to exits and inefficient evacuation.	Considering that emergency situations may arise from natural phenomena or as a result of human actions, the study and knowledge of the premises' accessibility, alert systems, orientation and rapid and safe deployment of circulation areas and flight is crucial [10].
Air transportation was of essential for agility in the rescue of victims.	The use of helicopters in the distribution, reallocation and humanitarian aid is an activity of great importance for the relief of the victims suffering, and must be included in a system of emergency response [26].
Effective logistics employed in the victim life support.	The unpredictability of demand, immediate response, and lack of adequate physical structure are common elements in a mass disaster. It is required optimal coordination, organization, and a coherent strategy to maximize results [23].
Information was broadcasted in "real time" through the internet.	Online media are potentially powerful in terms of the speed of news dissemination, as they have become a common element of everyday life [5] [11].
Online social networks used to circulate information, organize actions, and promote social mobilization.	One of the great advantages of the use of online media is the interactivity and the exchange of information and content. Online social networks provide a space for social interventions through community support and mobilization [15].
Blood banks of several cities of the state were at capacity as a result of the overwhelming attendance of blood donors.	Supply management is essential to determine the distribution of resources and the actual demand for donations, making the supply chain more efficient and effective [21].
Prior to the fire, there was no disaster response plan in the city, nor any previous training for such situations.	In the absence of an effective response plan, the negative consequences of mass disasters for the site and the population may be magnified. From the need to address these types of emergency situations, the concept of humanitarian logistics arises from the need to address these types of emergencies [17]. Training institutions, government agencies and the population on disaster preparedness and response is essential to achieve greater coordination in cases of mass disasters [1].
Complex and effective coordination of volunteers and institutions.	Coordination is an essential mechanism for an efficient and effective response [22]. Coordination is the synergic interaction among the actors involved in an event. It occurs at three different levels (strategic, tactical, and operational), and is mainly responsible for the distribution of tasks, information sharing and decision making [4].

main elements of the Kiss nightclub case in comparison to what the logistics literature advocates in events of mass disaster, approaching the over nightclub capacity, the difficult access to exits and inefficient evacuation, the agility in the rescue of victims, the victim life support and the complex and the effective coordination of institutions.

5. Conclusion

Humanitarian logistics is essential in the case of disasters, especially regarding the management of supplies, coordination, and communication strategies. In the Kiss nightclub fire, despite some logistic adversities, the response was mostly effective, especially in the coordination of the supply chain and the health care for the survivors. The media also played a significant role stimulating blood dona-

tions. After the incident, the focus on preparedness and training substantially increased, and a more efficient and effective plan for the response phase was developed. The analysis of this type of mass disaster may contribute to identify effective strategies and barriers, and further research in the area of humanitarian logistics is essential to tackle limitations in the response to mass disasters.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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