

Review Article

Drug Management in Crisis and Disaster in Selected Countries and Iran

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ABSTRACT

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Introduction: Iran is one of the seven countries in the world with natural disaster distress. Moreover, due to its geopolitical situation and strategic importance, it has always been invaded by neighbors or the developed countries. Medical healthcare of the injured people and distributing medicine in the beginning hours of the disasters and crises have great roles in decreasing pain, fetal injuries and increase in the healing and the survival of the injured. In the present study, to evaluate the defects in drug distribution and necessary health care applications during disasters, the corresponding research in Iran and selected countries have been presented to discuss damages resulted by mismanagements during crises .

Methods: The PubMed, Google Scholar and Iranian databases were searched about crisis management with “management”, “medicine”, “drug”, “crisis” and “disaster” as keywords individually and in combination.

Results: The efforts during disasters, the shortcomings and defects were evaluated. The related data in some countries were also reviewed and the viewpoints for drug management in disasters and crises in Iran were presented.

Conclusion: Regarding the damages caused by drug deficiency and the importance of well-organized drug management, it will be possible to save peoples life by efficient drug management and well-planned distribution of medications during natural and man-made disasters.

Introduction

In recent decades, numerous studies and researches have been conducted on crisis and how it is formed and managed, with different perspectives and methods. Some researchers have based their analysis on case studies. Other groups have conducted comparative studies and some have adopted experimental approaches.

Since crisis covers all aspects of human life including social, economic, political and cultural aspects, researchers have provided numerous definitions and concepts. Crises occur naturally or by humans and impose hardships on human society demanding fundamental and extraordinary measures to

resolve (1). Disasters are actually events that, from a public health perspective, no one can get out of without change, while these changes are not the same for everyone (2). Health services play a key role in saving human lives in natural and man-made disasters and they often have a significant impact on the health of people affected. Providing health services in times of disasters and crises is one of the most important challenges in crisis management (3). Comprehensive crisis management is the process of planning, performance and executive actions carried out by governmental, non-governmental and public agencies for recognition and

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reduction of risk levels (risk management) and management of confrontation, reconstruction and rehabilitation operations in the affected area (crisis management) (4). Currently, the main weaknesses of crisis management are lack of coordination and cooperation of organizations, lack of comprehensive rules, inefficiency of existing regulations, and limited financial resources (1).

Iran is exposed to many disasters, crises and problems. Medical service sectors are of the most important sections in these situations. Therefore, it is necessary to define mechanisms for greater coordination through creating a reliable environment and exchanging information. Health-related systems should strengthen information management. The presence of trained and experienced people in the emergency department is also very important in the efficiency of assistance (5).

During 1992-2001, 9.28% of Iran total population was disturbed by natural disasters and thousands of people died. Earthquakes in Buin Zahra (1962), Rudbar (1990), Bam (2003), Ezgeleh (2017) and 2019 flash flood in Golestan, Fars, Khuzestan and Lorestan provinces affecting many people are examples of natural disasters in Iran. Considering that Iran has been through many disasters and is among the world's leading countries in this case and also its high-risk geographical position from different dimensions, a model for improving the country's disaster management system should be designed and provided. Certainly, designing an appropriate model causes society to suffer the least economic, human and social damages when dealing with disasters (6).

Another important point is that although Iran's sanctioning countries claim that medicine is an exception, sanctions on Iran's banking sector hinder the importation of medicines into the country, putting the lives of many Iranian patients with certain diseases such as thalassemia, hemophilia, hepatitis, MS and diabetes at risk (7).

One of the most important, strategic and essential items in disasters and crises that affects the health and survival of the victims is medicine. In different countries, there are different approaches to deal with this challenge. Pharmaceutical products are essential goods with different characteristics (8). In fact, medicine is one of the most important items needed to save the lives; availability of drugs in health centers and hospitals is one of the priorities of drug management in crucial situations.

Compiling the list of medicines needed in crisis or disaster (natural or man-made) is one of the essentials and of great importance. The prediction of this list varies according to the types of disasters. For example, in chemical, nuclear, flood, storm and earthquake events, the types of these drugs are different. The priority of taking these drugs changes 72 hours after the occurrence (9).

Due to the variety of their educational programs in different sciences during their education, pharmacists have the ability to work in different fields related to life sciences and medicine, and this variety of educational areas, is considerable. Pharmacists in Iran, unlike most countries in the world, are trained up to Pharm D level and have to choose a research project as a thesis to obtain their degree, which significantly increases their research and crisis management ability (10).

A protocol of drug performance in crisis should include all parts inside and outside the organization and determines the role of drug manufacturers and distributors, for example, it is necessary to always have a permanent stockpile of drugs needed in crises, this inventory should be calculated and maintained accurately based on the population of different regions. The type of drugs kept in these warehouses should be calculated and maintained accurately and follow the list of drugs needed in such crises. A list of operational and emergency medicines should also be prepared and in addition to the drugs needed in crisis, special drugs that are necessary in the

treatment of modern warfare weapons (NBC) should be considered. According to the current laws of the Ministry of Health and Medical Education and the Food and Drug Organization of Iran, the list of medicines needed in natural and man-made crises and disasters should follow the accepted list of the country. Prescription, distribution and sale of drugs outside the list is a medical violation according to the laws and regulations of the Ministry of Health and Medical Education and the Medical Council of Iran. The Food and Drug Administration periodically announces this list and the relevant changes (11).

Providing a specific model of drug assistance system in crises can fill the gap and complete the missing link in crisis management system in times of disasters and crisis.

In the present work, the measures taken in drug management in critical situations in some disasters in Iran and some selected countries were investigated.

Material and Methods

In this research, the keywords of “management”, “medicine”, “crisis” and “disaster” were investigated individually and in combination in PubMed and google scholar databases as well as internal databases and resources and related studies on drug management in crisis and disasters in Iran and some countries including Japan, Turkey, Greece, Ethiopia, South Korea and the United States were evaluated during 2002-2018. The data was collected from published manuscripts, data bases and online accessed information that were cited in the text.

Results and Discussion

Some crises and disasters in different parts of the world and the related actions, policies and managements have been presented.

Management and Policies

Kalantari and colleagues in their research stated that coordination of senior managers in pharmaceutical systems with local authorities in order to support the crisis,

cooperation of drug distribution companies, cross-sectional shortage of some imported drugs, lack of adequate budget allocated for storing essential items and shortage of specialized manpower in order to continue pharmaceutical services during the crisis are the strong and weak points of the management in dealing with unexpected events. Consulting with pharmaceutical managers involved in past crises and analyzing their suggestions can empower the system (12).

On the other hand, Khairandish and Rashidian in their research concluded that most of the studies only explained the adopted policies, and fewer studies evaluated the effectiveness of these policies on access to drugs (13).

Natural and unexpected disasters

Providing urgent post-crisis medical care is one of the first steps the private sector can take part. Emergency medical personnel from the public and private sectors will rush to the scene, tasked with providing basic first aids and other essential services to the injured. Controlling bleeding, coping with shock and fixing broken bones, prescribing analgesics and injecting intravenous fluids are among these assistances (14).

Predicting the supply of drugs in earthquake-hit areas is one of the most important issues in crisis management planning. The study of Dr. Meymandi et al. showed that respiratory drugs, analgesic drugs, antimicrobial drugs, gastrointestinal drugs and those affecting the central nervous system constitute the most important pharmaceutical needs in earthquake-hit areas (9).

Since Iran is a large and vast country with a different range of natural disasters occurring, the necessity of anticipating programs and the need for organizational structure as the most essential issues in the field of natural disasters is undeniable. Using an appropriate model increases the speed of financing, reduces bureaucracy, and speeds up disaster management processes (15).

Given large tornadoes like Katrina that cause a lot of damage, and given that about 70% of Americans take drugs in these situations, the FDA has provided guidance on safety in drug use and made it available to the public. This guide explains things like not using drugs exposed to unhealthy heat or water, medications that need to be stored in the refrigerator, and similar information (16).

Chemical and microbial accidents

By presenting a list of drugs used in the treatment of poisoning caused by chemical and chemical accidents, Ghane et al. noted that the use of nuclear and chemical weapons against military and civilians during wars could lead to a humanitarian crisis. During the Iran-Iraq war, Iraq used chemical weapons against Iran, more than 100,000 Iranians, including civilians and military personnel, were injured and killed, which caused a man-made catastrophe and crisis throughout history. Due to Iran's experience and the existence of these weapons in some countries, it is necessary to prepare and educate against such crises and provide access to the necessary medicines, training and guidance for the treatment of the victims (17).

Actions taken

The World Health Organization (WHO) has prepared a list of basic medicines and medicines that all countries need in critical situations. An ideal kit can only be designed with accurate knowledge of population characteristics, outbreaks, death patterns and education levels of the covered population. The standard kit consists of two parts: a basic unit and a supplementary unit, a basic unit including essential medicines and medical equipment and equipment necessary for primary health care, which are used by primary health care workers with limited training (including health workers) and can include oral and topical medications that are not injectable. The supplementary unit includes an emergency kit for neonatal caregivers and medicine and medical supplies that is used for a population of 10,000 people only by

professional health workers or doctors who lack any medication and can therefore be used only when available (18).

The FDA's recommendation for pre-disaster preparation includes precautions to store water and ensure the health of food and medical facilities for individuals and pets during and after the storm and other items that can lead to power outages, river outbreaks and road closures (19).

In a comparative study titled "Conflicts and Disaster Management," Chang compares crisis management and flood control in South Korea and the United States. There are several important beneficiaries in disaster management, the most important of which are governments (federal, state and local), private entities (local residents and private companies) and NGOs. They all have different roles and responsibilities, and disasters directly and indirectly affect them. The difference between the two countries is cultural characteristics, management measures and governmental organizations, but the motivation of actors during the crisis period is similar in both countries (20).

In Ethiopia in 2014, a list of first level emergency drugs used in general and special clinics was developed. This list consisted of two parts: the first part contained common drugs and the second part included the classification of drugs needed in terms of disease and injury (21).

Norton et al. conducted a study and showed that in order to organize assistances in disasters, a guideline has been presented by the World Health Organization in which foreign donor groups are registered and organized, and the drugs donated by these groups must meet the world quality standards and comply with the guidelines (22).

Another study shows that using the experience of other countries to deal with accidents is very valuable. The Japanese have taken important measures in the areas affected by the accident, including employers visiting the affected areas. The government was able to use existing

measures to expand employment and support livelihoods to those affected (23).

In case of emergencies in Washington, emergency centers are formed where people can receive emergency medicines or vaccinations, according to emergency services. Medical centers will be held in large public buildings such as schools and churches in different areas of the city to minimize people's access time. Health centers information, the time and place of service and how to access services will be announced through television and radio, newspapers and websites (24).

In a recent study regarding Greek pharmaceutical market, the authors gave an overview of the essential components in crisis management and empirical analysis of crisis management readiness of Greek pharmaceutical companies, providing a practical model for business leaders in the Greek pharmaceutical market to help them assess their readiness levels and establish their own crisis management plans. The results of the survey show that the pharmaceutical industry is particularly vulnerable in crises. However, the results of the surveys show that Greek pharmaceutical companies have an acceptable level of crisis management (25). Another study presented that large pharmaceutical companies often have very complex relationships and the complexity increases the likelihood of a drug-related crisis, thus highlighting the need for pharmaceutical companies to have a guideline for effective crisis management in place. The report proposed a set of guidelines for crisis management specifically to a product or pharmaceutical activity. The steps were clearly specified and include 1; Crisis identification; 2: Specifying targets; 3: Preliminary assessment; 4: establishing communication programs; 5: Building communication infrastructure and 6: agree to and expedite operational plans (26). Meanwhile, it has been reported that common groups of drugs affected by the shortage include anesthetic drugs, antibiotics, analgesics, nutrients,

electrolyte products and chemotherapy agents; also, the economic and clinical effects of mineral deficiencies are significant (27).

As mentioned earlier, in Iran the Food and Drug Administration periodically announces the list of medicines needed in natural and man-made crises and disasters which should be followed regarding prescription, distribution and sale of drugs (12).

Conclusion

According to the above studies and the damages caused by drug shortage or lack of proper drug delivery in natural and man-made crises and disasters and pathology of crisis management efficiency, it can be summed up that management of drugs in crisis and disasters is of utmost importance. Effective planning and predicting the medical needs and services before the crisis is essential and will reduce the causalities in a crisis.

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