REVIEW ARTICLE

Role of Dentist in Disaster Management: A Review

Rahul Patel[1], Anagha Agrawal[2], Munni Chaudhary[3]

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Abstract

Both human resources and public health and medical systems are required in the event of a natural or man-made disaster. Healthcare professionals must be prepared and have the right mindset to manage a disaster effectively. Healthcare professionals' attitudes will affect how they react in any emergency circumstance. In the event of a declared medical emergency, dentists and dental assistants can supplement the current medical staff. The purpose of this essay is to discuss dentists' roles in disaster relief. To find all pertinent material, articles were searched throughout a number of medical databases, including Google Scholar, PubMed Central, ScienceDirect, Scopus, EBSCOhost, and Sci-Hub. The potential of dentistry in crisis management is revealed by the literature search, which also reveals the wide range of responsibilities that dentists can assume.

Keywords: Dentists, Disaster preparedness, Disaster response, Disasters, Mass casualty situations, Role.

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Introduction

If we no longer treat the deceased with respect, what hope do the living have? The United Nations Office for Disaster Risk Reduction (UNISDR) defines a disaster as "a major disruption of the functioning of a community or a society involving widespread human, material, economic, or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources."[1,2] A disaster is an unforeseen occurrence that can be man-made, natural, or hybrid in origin and that has the potential to severely damage the environment, property, and human life.[3] Both natural and man-made calamities impact millions of people annually. Explosions, earthquakes, floods, hurricanes, tornadoes, and flames are examples of disasters.[3] When a crisis strikes, people face the risk of physical harm or death. They might also lose their community, house, and belongings.[4] They run the danger of developing mental and physical health issues because of these pressures.[4]

Following a tragedy, stress reactions resemble the typical reactions observed after any kind of trauma. A wide range of emotional and physical responses can be triggered by disasters. Along with triggers or reminders of the trauma, individuals could also react to issues that arise after the incident.[4]

Disaster management, according to UNISDR, is the preparation, execution, and coordination of actions in anticipation of, responding to, and beginning the process of recovery from calamities.[2] Disaster response, disaster preparedness, and disaster mitigation are the three main facets of disaster management.[5]

After a disaster strikes, response is the series of actions taken to determine needs, alleviate suffering, stop the crisis's spread and effects, and pave the way for recovery.[6]

The actions that guarantee the systematic mobilization of people, money, supplies, and equipment in a secure setting for efficient relief are known as preparedness measures.[6]

Mitigation is the long-term lowering of a disaster's risk. Reducing the hazard's resistance and vulnerability is known as primary mitigation. Secondary mitigation is the process of lessening the impact of the risk (preparation).[6]

During their predoctoral training, dentists in India and abroad receive medical and surgical training that equips them to handle emergencies.[3] Additionally, they receive training on how to manage medical emergencies in hospitals and dental offices, including minor surgery, medication administration, injections, and anesthesia.[3] Furthermore, forensic odontology as well as dental professionals' assistance in Disaster Mortuary Operational Response Teams have been the main roles that dentists have performed in catastrophes.[3] Due to their invaluable skills, dentists are also employed in the military (Fig. 1).[3] Thus, the purpose of this article

[1–3]Department of Public Health Dentistry, Narsinhbhai Patel Dental College and Hospital, Sankalchand Patel University, Visnagar, Gujarat, India

Corresponding Author: Munni Chaudhary, Department of Public Health Dentistry, Narsinhbhai Patel Dental College and Hospital, Sankalchand Patel University, Visnagar, Gujarat, India, Phone: +91 7984365885, e-mail: chaudharymoon156@gmail.com

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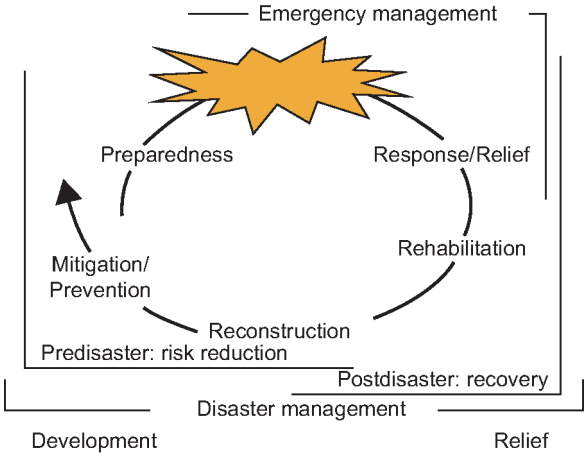

Fig. 1: Disaster management cycle (Adapted from Park K. Park's Textbook of Preventive and Social Medicine, 26th edition. Jabalpur: Banarsidas Bhanot; 2021)

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is to educate readers about different types of catastrophes and the role dentists play in disaster relief.

Disaster Levels

Level-L1: Carried out within the capabilities and resources of the district. The state authorities are still prepared to help if necessary.[2]

Level-L2: Demand assistance, the creation of state-level disaster management organizations, and proactive state-level resource mobilization. The primary organizations maintain an eye out for prompt deployment if the state calls for it.[2]

Level-L3: A situation that is almost catastrophic or a massive calamity that overpowers the government and local authorities.[2]

Disaster Management Goals

- Minimize (prevent, if at all feasible) the possible loss due to risks.
- Ensure victims receive timely and appropriate assistance when needed.
- Make a quick and long-lasting recovery.[2]

Emergency

Emergency is a situation where extraordinary steps are taken to prevent a calamity and regular procedures are suspended. It is possible to characterize an emergency in terms of the social, political, and epidemiological conditions around it.[6]

Response

Response is the collection of actions taken following a disaster to determine needs, lessen suffering, stop the disaster's spread and effects, and pave the path for rehabilitation.

Rehabilitation

Rehabilitation is the return of fundamental social roles.[6]

Reconstruction

The probability of a disaster is permanently decreased when mitigation is fully resumed. Reducing vulnerability and the hazard's resistance is known as primary mitigation. Secondary mitigation is the process of lessening the impact of the risk (preparation). Recognizing that disasters will happen, attempting to lessen their negative impacts, and limiting their influence on human suffering, financial resources, socioeconomic activity, and preventive efforts are all part of mitigation.[6]

Preparedness

The steps that guarantee the planned mobilization of people, money, supplies, and equipment in a secure setting for efficient relief. Building up capabilities prior to a crisis scenario occurring to lessen its effects is known as disaster preparedness. Food reserves, emergency funds, seed reserves, health facilities, warning systems, logistical infrastructure, relief manuals, and project shelves are only a few of its initiatives.

Major Disasters in India

The Bhopal Gas Disaster in 1984, the Gujarat earthquake in 2001, the Indian Ocean tsunami in 2004, 2008: attacks in Mumbai, floods in Uttarakhand in 2013, floods in Jammu and Kashmir in 2014, 2016: forest fires in Uttarakhand, 2018: dust storms in India, and the coronavirus pandemic of 2019–2020.[6]

Disaster Management Act

A National Disaster Management Plan (NDMP) for the entirety of India is required per Section 11 of the DM Act 2005. The NPDM of 2009 and the DM Act's requirements that the Government of India and its key ministries have sufficient DM plans are both met by the proposed NDMP.[2]

Role of Dentists

Large numbers of casualties may not require medical attention until after a certain kind of tragedy. Since most injuries happen during the impact, the first several hours are when emergency care is most needed. Mass casualty management is further broken into search and rescue, first aid, victim triage and stabilization, hospital care, and patient transfer to another hospital if necessary.

Search, First Aid, and Rescue

The demand for first aid, rescue, and search during a large disaster is expected to be so high that organized relief organizations will only be able to cover a small portion of it. The unharmed survivors provide the most rapid assistance.[5]

Dental Surveillance

By staying informed about uncommon clinical presentations and uncommon disorders in the community, dentists can participate in an efficient monitoring network. To aid in the early identification of a bioterrorism strike, dentists can also notify public health officials of patients who have cutaneous, intraoral, or both types of lesions. Early diagnosis of an infectious pathogen in a community helps reduce mass mortality by enabling timely preventative and curative measures.[7]

Dental Offices Serving as Medical Facilities

Dental offices have the necessary supplies and equipment to act as decentralized auxiliary hospitals in an emergency. Offices equipped with air and suction lines, X-ray equipment, and sterilizing techniques can function as self-contained alternative medical facilities if hospitals are attacked or are dangerous because of widespread diseases linked to biological weapons. No other medical professional has a clinic as well-equipped to serve as a backup medical location in the event of a major calamity.[2]

Distribution of Medication

Following a disease outbreak, dentists can prescribe and supply the necessary drugs under the direction of public health experts. Dentists can monitor patients for adverse reactions and side effects and refer them to doctors for additional care if needed. Additionally, dentists can provide information regarding the medication, its application, side effects, and patient compliance requirements.[2]

Immunization

There might not be enough doctors and nurses on hand to implement vaccination campaigns in a constrained amount of time. Trained dentists can take part in mass vaccination campaigns as part of urgent programs. Dental clinics can also serve as immunization locations to reduce the number of potentially infected patients.[7]

Definitive Treatment

In addition to providing patients with various injuries with esthetic and surgical services, oral and maxillofacial surgeons are trained to provide cardiopulmonary resuscitation, endotracheal intubation, and first aid. Dentists can recognize the signs and symptoms of infectious diseases that kill large numbers of people. Dentists routinely collect nasal swabs, salivary samples, and other materials for laboratory processing, which enables accurate diagnosis, treatment progress reports, and patient infection status.[2]

Triage Services

"Triage" is derived from the French term "triage," meaning "to sort out." During a mass casualty event, it would not be feasible to treat every casualty immediately due to a lack of facilities, manpower, and medical supplies. Triage must be carried out in these circumstances to prioritize the treatment plan. Dentists can assist with various treatment techniques without additional training. Instead of screening casualties, this allows doctors to provide definitive care for patients who are most in need. Dental clinics might act as triage centers, with red denoting high-priority treatment transfer, yellow for medium-priority patients, green for ambulatory patients, and black for patients who are dead or moribund.

Forensic Assistance

One thing that sets dentists apart in catastrophic situations is their role in forensic assessment. Assessing bite marks and patterned skin injuries is part of the identification of human remains for mass disaster management using dental materials found in the analysis. Dental identifications are essential for victim identification in the event of a natural or man-made disaster. The law mandates that dental professionals maintain adequate patient records. Dental records can also be used in judicial proceedings, teaching, research, and forensic cases. Thorough and accurate recordkeeping is an essential component of dental practice.[2]

Supporting Other Health Professionals

Private practitioners and local dental associations should inform emergency response planners about the services rendered by the dental profession in an emergency. Dentists can provide certain treatments that are usually limited to physicians when the local medical system is unable to care for the increasing number of patients. Until the need for urgent care arises or another group of physicians arrives, dentists can increase the local medical system's surge capacity.[7]

Infection Control

Dentists may contribute their expertise to mass casualty scenarios and are trained in asepsis. They can assist in decontaminating victims of specific bioterrorism assaults when caregivers may become infected by contact with a patient's clothing or skin surfaces. Dentists experienced with disaster mortuary procedures can be helpful in handling the remains of victims who died from contagious diseases.[7]

Quarantine

Strict quarantine regulations should be implemented during a pandemic or after a bioterrorism event involving a communicable agent, as primary care providers may infect themselves or come into contact with patients undergoing treatment. Individuals are less likely to infect dentists because sick people avoid visiting dentists and may miss appointments if severely ill. Dentists could be asked to offer some basic medical care to those in the quarantined area.[7]

Disaster Victim Identification

After a large disaster, one of the most reliable ways to identify victims is through dental evidence. The jawbone's structure or dentures of various sizes, forms, makers, and compositions can be used to identify people who have lost all their teeth. Additionally, dental information can be used to ascertain a person's age, gender, and race. Dental abnormalities such as missing teeth, extra teeth, or an extra cusp can serve as a crucial foundation for identification. Dental problems can also provide a rapid, accurate, and reliable way to estimate age during emergencies.[2]

Tagging

Every patient should have a tag that includes their name, age, origin, triage category, diagnosis, and first course of therapy.[5]

Conclusion

For every hospital or community, disasters happen suddenly and without warning. In these situations, the hospital's response is vital to saving lives. Healthcare professionals' attitudes about disaster management are crucial because they affect how they react in any catastrophe. By offering high-quality information about the likelihood of attacks, their aftereffects, and the proper actions to take in response, dentists may benefit both their patients and the communities in which they practice.

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