

## Role of Dentist in Disaster Management: An Indian Perspective

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**Abstract:** Natural or manmade disaster comes with the need of both manpower as well as health care and public health systems. This calls for provision on the part of the health care workers. Dentists are not perceived as much of help in case of any disaster event. Usually the first responders are primarily looked upon for in the case of any disaster response; if called upon the dentists they can be a source of vital support in medical surge events. Dentists and dental auxiliaries can aggrandise the existing medical professionals, in responding to a declared medical calamity. This paper aims at discussing the role of dentists in disaster management. Articles were searched in various medical databases such as Google Scholar, Pubmed Central, Science direct, Wiley online Library, Scopus, Copernicus to gather all relevant info. The literature search unwrapped the potential of dentistry in disaster management revealing the extended roles of a dentist.

**Keywords:** Dentists; Disasters; Role

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### I. Introduction

A Disaster is an occurrence that disturbs the normal living conditions and causing a level of suffering that exceeds the capacity of adjustment of the affected community.<sup>1</sup> According to The United Nations Office for Disaster Risk Reduction (UNISDR) disaster is “A serious 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.”<sup>2</sup> Disaster Management under UNISDR is defined as - “The organization, planning and application of measures preparing for, responding to and, initial recovery from disasters.”<sup>2</sup> The number of casualties have increased at such an extent that has decreased the ability to respond, which is further delayed by fear and the urgent need of information. All disasters are independent of their origin and reflect unique environments, needs and risks within a particular state, jurisdiction and community. Over the past couple of years, the governments of countries like India and Nepal have brought a paradigm shift in approach to disaster management. This approach has been translated into a national disaster framework and has been shared with all sub-divisional governments and administrations having a common scheme. The roles of traditional first responders shift in case of severe disaster events, particularly when the number of victims overflows the hospitals and clinics. In such situations, dentists and dental auxiliaries play a vital role in response to disaster by a wide range of skill sets based on personal experience, training and enthusiasm.<sup>3</sup>

#### Levels of Disasters:<sup>4</sup>

Level-L1: managed within the capabilities and resources at the District level. However, the state authorities will remain in readiness to provide assistance if needed.

Level-L2: require assistance and active mobilization of resources at the state level and deployment of state level agencies for disaster management. The central agencies must remain vigilant for immediate deployment if required by the state.

Level-L3: nearly catastrophic situation or a very large-scale disaster that overwhelms the State and District authorities

#### Objectives of Disaster Management:

- Reduce (avoid, if possible) the potential loss from hazards.
- Assure prompt and appropriate assistance to victims when necessary.
- Achieve rapid and durable recovery.

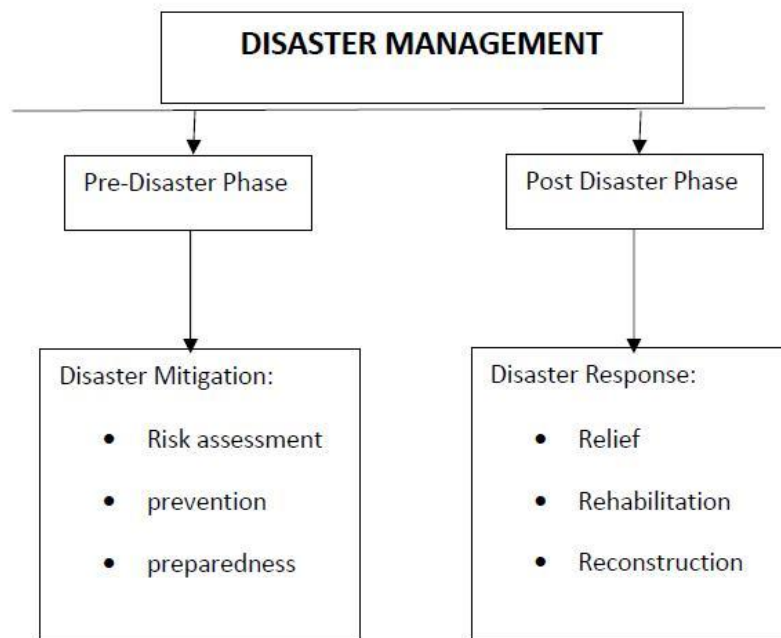


Fig-1 Disaster management: leading activities and related terms

#### Major Disasters in India:<sup>5</sup>

- 1984 Bhopal Gas Tragedy
- 2001 Gujarat earthquake
- 2004 Indian Ocean tsunami
- 2008 Mumbai attacks
- Uttarakhand floods 2013
- Jammu Kashmir floods 2014
- 2016 Uttarakhand forest fires.
- 2018 Indian dust storms.
- 2019-20 Corona virus pandemic

#### Disaster Management Act

Section 11 of the DM Act 2005 mandates that there shall be a National Disaster Management Plan (NDMP) for the whole of India. The proposed NDMP complies with the National Policy on Disaster Management (NPD) of 2009 and conforms to the provisions of the DM Act making it mandatory for the Government of India and various central ministries to have adequate DM plans.

#### Role of Dentists

##### Dental Surveillance:

Dentists can be a part of effective surveillance network by getting updated on the information on unusual syndromes in the community as well as unusual clinical presentations. Dentists can also notify the public health authorities about the presence of patients with intra-oral or coetaneous lesions or both, thus helping the early detection of a bioterrorism attack. Early detection of an infectious agent in a population can lead to reduction in mass casualties by prompt prevention and therapeutic methods.<sup>6</sup>

##### Dental Offices Acting as Medical Sites:

Dental offices are well equipped and supplies to serve as decentralized auxiliary hospitals in case the need arises. Availability of air and suction lines, X-ray equipment and sterilizing techniques in dental offices can be used as self-contained alternate medical sites if hospitals are under attack or are unsafe because of widespread infection associated with biological weapons. No other health professional has such well-equipped clinic to provide as alternative medical site for use during an event of catastrophic disaster.<sup>7</sup>

**Distribution of Medication:**

Dentists can prescribe and dispense the required medications, after the outbreak of the disease; this can be guided by public health officials. Patients can be monitored by dentists for adverse reactions and side effects, and if necessary, they can be referred to physicians for further treatment. Dentists can also be a source of information about the medication and its use, side effects and the need for compliance for the patient.<sup>7</sup>

**Immunization:**

The number of physicians and nurses available may not be able to implement immunization programs in limited time. In urgent programs, trained dentists can participate in mass immunization programs. Dental clinics can also be considered as immunization sites to minimize the concentration of potentially infected patients.<sup>8</sup>

**Definitive Treatment:**

OMFS are appropriately trained to provide first aid, endotracheal intubation, cardiopulmonary resuscitation as well as aesthetic and surgical services to patients with different injuries. Dentists can identify the infectious disease that causes mass casualties and can recognize the sign and symptoms of that disease. Dentists regularly collect salivary samples, nasal swabs, or other specimens for laboratory processing, leading to proper diagnosis, information about progress of the treatment and the status of the infection of patient.<sup>9</sup>

**Triage Services:**

Triage is derived from French word 'trier', which means to sort-out. During a mass casualty event when there may be deficiency of personnel, facilities, and medical supplies, it may not be possible to give immediate treatment for all casualties. In such situations, triage must be done to prioritize treatment plan. Dentists hence can provide assistance in these treatment procedures without further training. This provides additional help to physicians providing definitive care for patients most urgently in need rather than screening casualties. Dental offices could serve as triage centers if needed, Red color indicating high priority treatment or transfer. Yellow color for medium priority. Green color for ambulatory patients. Black color is for dead or moribund patients.<sup>10</sup>

**Forensic Assistance:**

This is one area which makes the dental professionals unique in disastrous events. Identification of human remains to mass disaster management, including the assessment of bite marks and patterned skin injuries along with the use of dental materials in the examination of evidence. Dental identifications play a key role in victim identification during natural and manmade disaster events. The legislation compels dental professionals to produce and maintain adequate patient records. Dental records can also find their use in forensic cases, teaching and research, as well as in legal matters. Comprehensive and accurate records are a vital part of dental practice.<sup>11</sup>

**Supporting Other Health Professionals:**

It is the responsibility of the private practitioners and local dental societies to make the local emergency response planners aware of the services rendered by the dental profession at the time of disaster. Dentists can be recruited to provide certain services that only physicians can do when there are inadequate local medical resources to cope adequately with increasing number of patients. Dentists can enhance the surge capacity of the local medical system until another team of physicians can arrive or the demand for immediate care decreases.<sup>12</sup>

**Infection Control:**

They are well versed and well-practiced for asepsis and can bring their expertise to mass casualty situations. Dentists can help to prevent decontamination casualties from certain bioterrorism attacks in which contact with patients' clothing or skin surfaces may also lead to the spread of infection to caregivers. Dentists already familiarized with the disaster mortuary activities can be useful in managing the remains of victims whose death is a result of infectious events.<sup>13</sup>

**Quarantine:**

During a pandemic or after a bioterrorism attack with a communicable agent, strict quarantine restrictions should be imposed primary care providers may become infected directly or through contact with patients seeking care. Dentists may not be similarly infected by patients because ill patients do not seek care from dentists and, if sufficiently ill, do not keep scheduled dental appointments. Dentists may be called on to provide some primary health care for people in the quarantined area.<sup>14</sup>

#### Disaster Victim Identification:

Following mass disaster, identification of individual victims by dental evidence is one of the most reliable methods of identification in such situations. Individuals with loss of all teeth can also be potentially identified based on the anatomy of the jaw bone or dentures with different shapes, sizes, manufacturers and compositions. Moreover, dental data can also be used to determine individual's personal data such as age, race and gender. Dental anomalies like missing teeth, supernumerary teeth and presence of extra cusp can also form important basis of identification of an individual. A quick, valid and reliable method of age estimation during the times of disasters can also be offered by dental tissues.<sup>15</sup>

The role of dentists has been reported in treating facial injuries sustained during the earthquake that struck China in 2008. About 8.9 per cent of the patients who sustained facial injuries in that earthquake were under the care and treatment of dental team members.<sup>16</sup>

#### Existing Curriculum in Dental Institutions:

Hospital-based training and education (in medicine and surgery) are important components of specialized dental professional training. Knowledge and skills of an average dental graduate may be utilized by the public healthcare system in times of crisis. However, a revised curriculum with the inclusion of handling of medical emergencies needs to be enforced in all dental teaching institutions.

## II. Conclusion:

The established public health system and medical community members must understand that, in medical surge events, dental personnel form an additional source of assistance in response activities. The need of the hour is to develop bio-defense by full international cooperation and to educate the populations about precautions and protective measures to be taken in any attacks.

Dentists can provide a valuable service to their patients and communities by providing quality information regarding possibility of attacks, after effects of these attacks and appropriate steps to be taken in response to such attacks.

The current outbreak of fatal virus- the Corona virus in the whole world starting from China is the matter of concern in the present scenario, which needs an immediate need for all the medical professionals including Dentists to unite and work towards it.

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#### Author contribution statement

Verify and confirm that everyone who contributed to this manuscript is listed as an author.

#### Conflict of interest statement

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