



EVALUATION OF DISASTER PREPAREDNESS IN PUBLIC & PVT TERTIARY CARE HOSPITAL IN DELHI NCR

Community Medicine

Dr Pradeep Srivastava*

Brig (Medical) HQ Medical Branch , Southern command , Pune Cantt , Maharashtra 411001 *Corresponding Author

Dr Madhav Madhusudan Singh

Commanding officer, 322 Fd Hospital C/o 56 APO

Dr J P Prasad

Brig Ic Adm , Command Hospital , Udhampur

ABSTRACT

Introduction: Disaster can strike any time and can cause severe catastrophe to us. It strikes with suddenness and fury and has a curious tendency of choosing the most inappropriate moment. While it is very difficult to prevent disasters, it is certainly possible to be prepared for facing and handling the disaster situation in a way that ensures minimum damage to life, limb and property. Hospitals are organization that remains full of people round the clock and any disaster affecting hospital can cause heavy damage to life. Disaster poses a unique challenge for every medical care facility in terms of infrastructure, capability, & preparedness. As every disaster presents extremely diverse & multi-dimensional problems, hospitals will require formulating their disaster response plans to adequately respond to each possible situation.

Aim: To evaluate disaster preparedness of select Public & Pvt multispecialty hospital at Delhi NCR.

Objectives: To study the disaster preparedness of the select Public & Pvt multispecialty hospital at Delhi NCR, by using checklist.

Materials and Methods: A validated checklist with 25 parameters based on saint Luis Disaster Plan check list and NDMA guideline prepared for evaluating the disaster preparedness of select public & Pvt Hospital of Delhi NCR. In addition to the checklist, formal and informal discussions and interviews were carried out with the key functionaries to identify deficiencies in the input, process and output.

The saint Luis Disaster Plan check list along with NDMA guideline¹, used for the study to assess the State of preparedness of the Hospital has 25 broad parameters. They are as under:

1. Foundational Consideration
2. Surveillance
3. Identification of Authorized Personnel
4. Activation of The Plan
5. Alerting System
6. Response
7. Hospital Disaster Control Command Centre
8. Security
9. Communication System
10. Internal Traffic Flow and Control
11. External Traffic Flow and Control
12. Visitors
13. Media
14. Reception of Casualties and Victims
15. Hospital Evacuation
16. Relocation of Patients and Staff
17. Hospital out of Communication or Cut off from Resources
18. Equipment, Services, Facility and Laboratory Assessment
19. Pharmaceuticals
20. Post Disaster Recovery
21. Education and Training
22. Key Internal Personnel
23. Key External Personnel/Agencies
24. Incident Command System
25. Exercising The Disaster Planning Programme

This checklist was circulated for different group of officials as relevant to the particular department or services for which they are responsible for and associated with. For examples, the questionnaire related to Security facilities were addressed to the Chief Security Officer and questionnaire related to the public relation concern was sent to the Public Relation Officer. The results were recorded in Disaster Plan evaluation check list in 'Yes', 'No' or 'Not Applicable' (N.A).

Results: The findings of the base-line evaluation based on checklist were used to identify the deficiencies in the existing system of disaster preparedness and response through system analysis of inputs, process and outputs of both public and Pvt multispecialty hospital. Both hospitals have a large number of deficiency to handle the victims. The systems are in place but need to reorganized and implementation to be done in strict manner.

Conclusions: This study had the aim to evaluate the disaster preparedness of the Select Public & Pvt Hospital. A Disaster Plan should be prepared, circulated and implemented exercising Principles of Management of Planning, Organizing, Staffing, Leading, Controlling along with PDCA cycle approach (Plan, Do, Check and Act).

KEYWORDS

Disaster preparedness, Hospital, Internal & External disaster, response

Introduction

For a hospital, disaster has been defined as a situation, in which number of patients arriving for immediate care, within a given frame of time-period, exceeds the capability of the hospital to provide care without

external assistance. Every tertiary care hospital needs to have a well-documented & rehearsed disaster response plan² to mobilize its resources, train its employees, control, & co-ordinate all activities in the face of actual occurrence of a disaster. Disaster preparedness¹ of a

hospital depends on the following:-

- (a) Existence of a plan based on optimum handling capability.
- (b) Awareness of the hospital staff about the disaster plan.
- (c) Disaster Organization.
- (d) Disaster drill.
- (e) Regular evaluation of the drill to improve upon deficiencies.

In India, experiences from the Gujarat earthquake of 2001, the Indian Ocean Tsunami of 2004 and the Kashmir Earthquake of 2005 have shown that disasters affect not only the population but also health facilities. Particularly when the Children's Hospital in Jammu collapsed; in the city of Bhuj, where thousands of people died and the civil hospital was reduced to a heap of debris when it was needed the most. The fire in AMRI Hospital in Kolkata, where more than 90 people died, reminded us that it is not simply the structural resilience but also operational resilience of hospitals that needs to be addressed, if we wish to reduce the impact of disasters on hospitals.

Both these instances of the civil hospital collapsing in Bhuj and the fire in AMRI Hospital in Kolkata, provided evidence based lessons of the underlying vulnerabilities that cause hospitals to get affected by disasters, which may be broadly grouped as follows:

- Inadequate or non-compliance of structural elements of hospitals to building codes and other safety norms which result in the failure of hospital structures and their component non-structural elements;
- Absence of an operational Hospital Disaster Management Plan;
- Lack of planning and preparedness to respond to disasters;
- Inadequate or complete lack of internal and external communication; and
- Lack of networking amongst hospitals.

Hospital preparedness covers a multitude of inter-related areas of medical & non-medical disaster management. Earlier the focus of

preparedness used to be on natural calamities like earthquake, floods, cyclone, & man made calamities like accidents. Because of the changing socio-political scenario, hospitals have to remain prepared for manmade disasters created by the acts of terrorism including the weapons of mass-destruction in the form of chemical, biological & nuclear weapons.

In absence of a documented disaster plan, the response to disaster is bound to be ad-hoc, haphazard & will lack coordination amongst various functionaries of the hospital. This will definitely reduce the overall efficiency of the hospital during disaster, despite having one of the best possible reserves of resources in terms of technical work force, abundance of logistics & expertise in the country.

A disaster which occurs within the own facility such as fire or explosion, major power failure, employees agitation or strike, for which need for extra hospital personnel or seeking assistance from the outside agencies arises, to care for, to evacuate the patients and to contain and mitigate the situation, is termed as Internal Disaster³.

Aim

To evaluate disaster preparedness of select Public & Pvt multispecialty hospital at Delhi NCR.

Objectives

To study the disaster preparedness of the select Public & Pvt multispecialty hospital at Delhi NCR, by using checklist.

Material & Methods

The checklist was prepared based on the saint Luis Disaster Plan check list and NDMA guidelines for hospital. It was validated and after validation the checklist was circulated to key personal of both hospital and all facility verified on ground.

Sr no	Checklist	Public Hospital (Yes / No /NA)	Private Hospital (Yes / No /NA)
1.	Foundational Consideration : • Existence of a Documented Disaster Plan for the Hospital • Does the plan detail actions to be taken for both internal and external disasters?	Yes No (Only External)	Yes Yes
2.	Surveillance : existence & availability of an effective surveillance system	No	No
3.	• Identification of Authorized Personnel to command, control & coordinate the disaster management activities, line of authority, assembly points for the staff etc. • Is there an individual designated as a disaster coordinator on a 24- hour per day basis? • Is a notification system in place that can alert personnel to a potential disaster situation?	No (Policy exist but not implemented on ground) No No	Yes No No
4.	• Activation of The Plan on frequent interval • Does the plan specify the circumstances under which the plan can be activated?	In last one year only once Yes	Every 6 mths Yes
5.	• Alerting System • Does the plan provide for activation within 1-2 hours during normal as well as off hours including weekends and holidays? • Does the plan provide for alternative systems of notification that considers people, equipment, and procedures?	Yes No No	Yes No No
6.	Response to disaster Has the hospital/healthcare facility developed internal disaster plans for internal emergencies?	Not happened in last 1 year No	Not happened in last 1 year Yes
7.	Hospital Disaster Control Command Centre : availability and functional aspect	Available but not functional	Available & functional
8.	Security • Ability to lock down the facility • Can the staff gain entry to the facility if called back on duty • Steps for minimize entry and exit points • Facility for establishing credential for health care workers from outside	Yes No No No	Yes Yes No No
9.	Communication System • Status of communication system • Existence of back-up /alternate method of communications, in case of failure of the existing facilities.	Yes No	Yes No
10.	Internal Traffic Flow and Control : existence of plan for Internal Traffic Flow and Control system in the events of disaster	NO	NO
11.	External Traffic Flow and Control : State of arrangement for External Traffic Flow and Control	NO	NO
12.	Visitors : issues related to the management of visitors during disaster Does the plan include mechanism to deal with anticipated increases in visitors and curious onlookers seeking to gain entrance during disasters?	NO NO	NO NO

	Has provision been made to establish waiting areas, with supportive counseling, away from the Emergency Department to minimize unwanted access to the relatives and friends of disaster victims?	NO	NO
	Has provision been made to handle medical and emotional situations resulting from the anxiety and shock of the disaster situation? This includes dealing with the worried well.	NO	NO
13.	Media management	NO	NO
	Do the media have a designated area?	NO	NO
	Does the plan designate an internal spokesperson as a media contact?	NO	NO
	Does the plan determine the communication tree connecting the internal spokesperson with the external spokespersons for the Emergency Management Agency or other lead agency?	NO	NO
14.	Reception of Casualties and Victims:	Yes	Yes
	Is the reception area equipped with auxiliary power supply?		
	Is there a precise plan of action whereby at short notice (within 1 hour), multiple casualties can be received and: 1) Identified 2) Triage 3) Registered 4) Treated in designated treatment areas 5) Admitted or transferred 6) Transported as needed	Yes for all except 5 (transfer & 6)	Yes for all except 5 (transfer & 6)
	Are sufficient equipment, supplies, and apparatus available, in an organized manner, to permit prompt and efficient casualty movement?	No	No
15.	Hospital Evacuation		
	Is there an organized discharge routine to handle large numbers of patients upon short notice?	No	Yes
16.	Relocation of Patients and Staff	NO	NO
	Has provision been made for the movement of patients and staff to an immediate area of safe refuge within the hospital in the event the area must be evacuated or staff and patients relocated?	No	No
	Have agreements been made with other healthcare facilities for the relocation of patients should the facility be unable to support patient care?	No	No
17.	Hospital out of Communication or Cut off from Resources : state of preparedness in case the Hospital is out of communication of cut off from resources	Nil	Nil
18.	Equipment, Services, Facility and Laboratory Assessment : associated with assessment of hospital's capability in terms of vital equipments, services and laboratory services. Esp Ventilators (Adult) Ventilators (Paediatric) Ventilators (Neonate) I.V. Pump I.V. Poles Suction machines Beds Stretchers Wheel Chairs	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes (all to be taken out from wards ,No dedicated store)	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes (dedicated store , but only for 20 patients)
19.	Pharmaceuticals issues related to the level of safety stock of pharmaceuticals, which are essential for containment of disaster.	Not available to cater sudden influx of patient	Yes
20.	Post Disaster Recovery		
	Does the plan designate who will be in charge of recovery operations?	No	No
	Does the plan make provision for the following during recovery? 1) Documentation 2) Financial matters 3) Inventory and resupply 4) Record preservation 5) Cleanup 6) Hazard removal and cleanup 7) Salvage 8) Garbage and waste disposal 9) Utility and equipment servicing 10) Physical plant restoration and renovation	No	No
21.	Education and Training of staff for disaster	Occasionally	Occasionally

22.	Key Internal Personnel	Only Medical superintendent , Director and Head Emergency and Nursing suptd are in team	Medical superintendent , Director and Head Emergency and Nursing suptd , Lab In charge and Security in charge in team
23.	Key External Personnel/Agencies	Nil (Only Local Police auth informed as per policy)	Nil
24.	Incident Command System	No	No
25.	Exercising The Disaster Planning Programme	Occasionally	Occasionally

RESULTS:

DISCUSSION

Disaster is defined as “any occurrence that causes damage, ecological disruption, loss of human life or deterioration of health & health services on a scale sufficient to warrant an extraordinary response from outside the affected community or area”.

The Disaster Management Act⁵, which has been enacted by the Parliament of India in 2005, defines it as “A catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or manmade causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, or destruction of property, or damage to, or degradation of environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area.”

Hospitals are expected to play an important role for care of the people affected by any disaster. Therefore, the hospitals are required to have a proper, practical & effective disaster plan to avoid confusion, duplication of efforts, uncertainty & overlapping of authority at the time of disaster & more so, once the casualties start arriving at the hospital⁶.

As per the Disaster Management Act, 2005, Disaster Management means a continuous & integrated process of planning, organizing, coordinating & implementing measures which are necessary or expedient for the following objectives :-

- (i) Prevention of danger or threat of any disaster;
- (ii) Mitigation or reduction of risk of any disaster or its severity or consequences;
- (iii) Capacity building;
- (iv) Preparedness to deal with any disaster;
- (v) Prompt response to any threatening disaster situation or disaster;
- (vi) Assessing the severity or magnitude of effects of any disaster;
- (vii) Evacuation, rescue & relief;
- (viii) Rehabilitation & reconstruction.

The aim of the disaster plan in a tertiary care hospital is to train its staff to prepare them to optimize resource mobilization through coordinated response through a defined system of command & control, to be able to save maximum possible lives & limbs^{7,8}. The plan needs to accommodate alternative arrangements in case the hospital itself becomes the victim of disaster.

Kapoor⁹ describes the following templates of a Disaster Plan for a Medical Organization:

- (a) Simplicity
- (b) Adaptability
- (c) Concise
- (d) Clarity
- (e) Extension of normal hospital working
- (f) Practiced Regularly
- (g) Permanent & periodically updated
- (h) A part of Regional Disaster Plan

Kapoor⁹ emphasized on the following pre-requisites for Disaster planning which need to be deliberated before the plan is conceived:

- (a) Risk & vulnerability Analysis
- (b) Hospital's Capability Analysis
- (c) Cooperation between Hospital, Community and Civil Administration in Disaster Planning

RECOMMENDATIONS

Both hospitals should follow following to improve their disaster preparedness as under:-

- The Disaster Plan should be developed and tested.

- The plan may be reviewed by an empowered committee for review, addition, alteration, acceptance and implementation.
- Capacity building in terms of infrastructure and equipment through procurement.
- Capacity building through regular training of the staff drills and exercises including table top exercises.
- Capacity building to develop DNA testing facilities.
- Capacity building for Chemical, Biological, Radiological and Nuclear (CBRN) disaster management capability in conformity to the Govt. Policy.
- A part of the Plan or entire plan should be practiced periodically.
- Internal and external teams may be nominated as observer for the test exercises.
- Debriefing after activation of the Disaster Plan for containment of an actual event or test exercise should be done on regular basis.
- Development of and Standard Operative Procedure (SOP) by each clinical, non clinical, ancillary and services department for their own contingency plans for disaster response.
- Development of Job Action sheets/ cards by each department for their staff and to make them aware of and conversant to their individual as well as collective role and responsibilities.
- Regular liaison with the local, State and Central Govt. Agencies should be done for both hospital.
- Establishment of an alternate communication system and network in case of failure of land and mobile phone facilities.
- Conduct of joint exercises with local Govt. Agencies.
- To make the Disaster Plan available on the hospital website.
- Automation of Patients Tracking System through Hospital Information System and Networking.
- To introduce touch screen information system for patients' relative, media and hospital staff.
- To have electronic display system fixed at strategic places.
- Regular review of the plan to make it more users friendly, adaptable, relevant and up-to-date to the Hospital's capability.

DISASTER MANAGEMENT COMMITTEE

The hospital's **Disaster Management Committee** should be function under the **Chairmanship** of the **Director / CEO**. The **Medical Superintendent** will be the **Chief of Operations**.

Suggested composition of the committee is as under :-

- (a) Director / CEO - Chairman
- (b) Medical Superintendent and HOD Department of Hospital Administration - Chief of Operations
- (c) Prof. & HOD Surgery, Orthopedics, Neurosurgery, Internal Medicine, Anesthesia, Radio-diagnosis, Transfusion Medicine, Purchase dept head, head of Hospital Engineering services (SHE)
- (d) All members of the Faculty of the Department of Hospital Administration
- (e) Chief Nursing Officer (CNO)
- (f) Chief security Officer (CSO)
- (g) Any other member nominated/co-opted by the Chairman/Medical Superintendent

CONCLUSION:

Disasters have an uncanny ability to bring to the forefront vulnerabilities of systems, structures, processes and people which in turn cause large scale damages; and hospitals are no exception to this rule. It is strongly recommended that the interventions suggested in the recommendation should be implemented in a systematic and time bound manner, since disastrous events can happen anytime, anywhere and at any scale. This study had the aim to evaluate the disaster preparedness of the Select Public & Pvt Hospital. A Disaster Plan should be prepared, circulated and implemented exercising Principles of Management of Planning, Organizing, Staffing, Leading,

Controlling along with PDCA cycle approach(Plan, Do, Check and Act).

Source of Support: Nil

Conflict of Interest: None

REFERENCES

1. National Disaster Management Guidelines: Hospital Safety. A publication of the National Disaster Management Authority, Government of India. February, 2016
2. Parmar NK. "Disaster Management-An Overview" in Emergency Medical Services & Disaster Management-A Holistic Approach. Dave PK, Gupta Shakti, Parmar NK, Kant Sunil (Eds): Jaypee Brothers Medical Publishers, New Delhi, 1st Edition, 2001: 253-65.
3. Sternberg E: Planning for resilience in hospital internal disaster. Prehosp Disast Med 2003; 18(4):291-300.
4. World Health Organization: Coping with Major Emergencies-WHO strategies & approaches to humanitarian action, Geneva, 1995.
5. The Ministry of Home Affairs-UNDP Project No.IND/02/006. A project entitled "Disaster Risk Management Programme", Aug 2002.
6. The Ministry of Law & Justice (Legislative Department), Govt of India. The Disaster Management Act, 2005.
7. Burkle FM. Mass casualty management of a large-scale bioterrorist event: an epidemiological approach that shapes triage decision. Emer Med Clin N Am 2002;20:409-36
8. Cook L. Hospital disaster drill game: a strategy for teaching disaster protocols to hospital staff. J Emerg Nurs 1990; 16:269-73.
9. Kapoor P, Sandhu GS. "Natural Disasters" in Text Book of Environmental Emergencies. Anand AC, Narula AS, Kakkar R, Kalra R (Eds): Armed Forces Medical College, Pune, 1st Edition, 2006: 334-43.