



ASSESSING DISASTER MANAGEMENT AWARENESS AMONG HEALTH PROFESSIONALS IN DISASTER- PRONE UTTARAKHAND: A STUDY ON PREPAREDNESS AND KNOWLEDGE

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ABSTRACT

Background: A disaster is an unexpected event that creates widespread destruction and disturbs the normal functioning of the community. It is impossible to stop disaster to happen but through awareness and preparedness disaster impact can be reduced. Medical services are one of the services that are needed after a disaster occurs. So, all health professionals must be aware of disaster management and get their hospitals prepared. Uttarakhand is a disaster-prone state. This paper focuses on the awareness of disaster management among health professionals. *Method:* The study was conducted among doctors and paramedical staff in five hilly districts of Uttarakhand. *Result:* 50% of doctors and 50% of paramedical staff participated in this study. 67% of the participants were aware about the Hospital disaster committee formed (HDC), 60% of the participants were aware about the HDC members, 67% of the participants had the knowledge of Hospital disaster plans (HDP), 60% of the participants had the knowledge of the Hospital Incident Response system (HIRS) and 57% of the participants were aware about its functioning, 70% had a knowledge about triage and 63% had the knowledge of triage tags, 77% were aware about multiple communication system used in their hospital, 86% had the knowledge of the logistics supply, 93% had the knowledge about the surge capacity of their hospital, 83% participants knew the contact list of all hospital staff, 83% had the knowledge of hospital safety guidelines, 93% had the knowledge of disaster kit, 77% participants had knowledge of earthquake disaster, 83% participants had the knowledge of alternative electric supply, 75% had the knowledge of satellite phones, 70% had the knowledge of direction of the fire exit sign placed, 70% participants had the knowledge of fire exit plans, 70% participants knew the necessity of NOC to be taken from fire department and 93% participants knew the heavy items should be fixed to avoid from falling during earthquake disaster. Overall participants had 71% of knowledge in disaster preparedness.

Keywords: Awareness, healthcare professionals, hilly hospitals, disaster management, HDP (hospital disaster plan), HDC (hospital disaster committee), and HIRS (hospital incident response system)

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INTRODUCTION

A disaster is an unforeseen event that brings huge damage to society. This damage cannot be measured but varies the geographical location and climate [15]

Natural and manmade are two types of disasters. Earthquakes, floods, Cyclones, droughts, and are the major natural disasters.

India is one of the hazard-prone countries in South Asia. Earthquakes, floods, Droughts, Landslides, snowstorms, hurricanes, and cyclones have occurred many times.[15]

Disaster causes mass casualties which will overburden the healthcare system. Therefore, healthcare providers should attain the knowledge and skills to face such situations.

Disaster management is a comprehensive approach that deals with all four phases of management. These four phases are- mitigation/ prevention, preparedness, response & recovery [10]. Disaster Management Act 2005 has been executed as a central act to deal with the management of disasters. This is a 3-tier disaster management structure in India, featured at national, state & district levels. Under this act, the NDMA, SDMA, NEC, NDRF, NIDM & disaster-

related funds were established. [8] As per the Disaster Management 2005 act, government hospitals had to mandatory prepare disaster plans in India. This plan includes the formulation of the hospital disaster committee, roles and responsibilities should be well defined to all members and documented guide according to the guidelines of NDMA, 2005 [17]

In the disaster-prone map of India, Uttarakhand stood among the first five states in natural hazards like earthquakes, flashes, floods, cloud bursts, landslides, forest fires & frequent droughts. Most of the region in Uttarakhand is hilly, due to which there is difficulty in the availability of resources, and its remoteness and lack of awareness regarding disaster preparedness increases the risk to the state population. According to GSHAP data, the state of Uttarakhand falls in a high seismic hazards region. As per the 2002 Bureau of Indian Standard (BIS) map, Uttarakhand falls in zone 4 & 5. Uttarakhand has a geographical area of 53,483 sq km, 93% of which is mountainous & 64% is under forest cover. Uttarakhand has two divisions Garhwal & Kumaon. The state has 13 districts of which 7 belong to the Garhwal region (Pauri, Tehri, Chamoli, Haridwar, Dehradun, Uttarkashi, Rudrapur) & 6 belong to the Kumaon region (Almora, Bageshwar, Champawat, Nainital, Udham Singh Nagar, Pithoragarh). Chamoli, Rudrapur, Pithoragarh & Bageshwar falls in Zone 5 & remaining areas fall in Zone 4. The state has witnessed two major earthquakes (Uttarkashi 1991 & Chamoli 1999). This region has been considered a possible site for a future disastrous earthquake [2]. Hospitals are the first line of healthcare services in a disaster. They have an important and sensitive role in disaster management. All Health care professionals should always be aware of and prepared for this.

Doctors and paramedical staff working in the emergency department are usually the first teams to respond when a disaster occurs. So, they must be aware of all the procedures that occur during disastrous events. During mass casualty response, many important people need to stay aware of the situation that happens. Community leaders, EMS, healthcare personnel, public health officials, and government agencies must be in regular communication. Hospitals should use mass communication systems to communicate within the hospital system. [3]

Many studies have been conducted to assess awareness and knowledge among health professionals. Rahman et al. conducted their study in two medical colleges in Dhaka and found that the majority of the hospital staff had not attended any of the disaster training and evacuation exercises that needed to be done twice a year for all healthcare staff [13].

One study was conducted among nursing staff to assess the knowledge, and attitude of Chinese nurses and found that there was a need for plans to be developed to improve the knowledge attitude, and practice of nurses. [6]

Another study was conducted on awareness of hospital internal disaster management plans among health team members in a hospital and found that there was no disaster plans or evacuation plan. [4]

Tong et al. conducted a study on awareness among health professionals and medical students in China and found that medical teachers were well informed than medical practitioners and health administrators and public health students were better than clinical medical students [18]

One more awareness study was conducted regarding emergency and disaster management training and found that there was a lack of knowledge among health professionals regarding disaster preparedness due to deficient training programs. [9]

Another awareness study conducted on disaster management in Sorsogon Provisional Hospital found that healthcare workers were aware of disaster management along with risk reduction, accountability, communication, information sharing, education, and preparedness but the challenges for healthcare workers were insufficient equipment and facilities, and manpower for effective disaster preparedness. [11]

Singhal et al. conducted a study among medical internship students and found that the management was aware of disaster preparedness but lacked in practices. There was a need for regular training, work on drills performance, and plans to be regularly updated [16].

Methodology

Study Approach

A cross-sectional study was conducted among medical and paramedical staff from 23 hilly hospitals of five hilly districts (Tehri, Chamoli, Rudrapur, Uttarkashi, Pauri) of Uttarakhand to assess their level of knowledge of disaster preparedness. This study was conducted for a period of 6 months (November 2020 to May 2021).

Population Size:

The study population includes CHC, Sub-district, and District hospitals from five hilly districts. The total study population includes the medical and paramedical staff from 46 hospitals.

Sample Size:

23 hilly hospitals (16 Community Health Centre {CHC}, 3 Sub-District hospitals {S. DH}, and 4 district hospitals {D.H}) were selected for the study based on judgmental sampling. 150 doctors and 150 paramedical staff from these hospitals formed the sample size for the study.

A total of 300 samples were collected from these 23 hospitals through a close-ended questionnaire. 20 sets of Questions were constructed based on awareness about the Hospital disaster plans (HDP), Hospital Disaster Committee (HDC), Hospital Incident Response System (HIRS), functioning of HIRS, knowledge about triage and tags, Multiple communication systems, logistics supply, surge capacity, contact list, hospital safety guidelines, disaster kit, earthquake disaster, alternative supply of electricity, satellite phones, placement of fire exit arrows sign, and fire exit plans.

Data were entered in MS Excel for data analysis in the form of numbers and percentages for evaluating awareness. The results were in the form of tables and graphical representations. [12]. The significant difference in awareness level between doctors and paramedical staff was evaluated by p-value through the Chi-square test.

Results

Table 1 showed the distribution of hospital staff at various hospitals in the hilly region. 23 hospitals participated in this study and 300 were the responders. 10 participants participated from CHC (Community Health Centre) Pokhri, of which 5 were medical officers and the rest 5 paramedical staff. In CHC Ghat, 10 had responded, out of which 5 were medical staff and 5 were paramedical staff. In CHC Jakholi, 10 had responded, out of which 5 were medical officers and 5 were the paramedical staff. In CHC Joshimath, 10 had responded, out of which 5 were medical officers and 5 were paramedical officers. In CHC Augustmuni, 10 had responded, out of which 5 medical officers and 5 were paramedical. In CHC Gopeshwar, 10 had responded, out of which 5 were medical officers and 5 were paramedical officers. In S. DH (sub-district hospital) Karanprayag, 20 had responded, out of which 10 were medical officers and 10 were the paramedical staff. In D.H. (district hospital) Rudraprayag, 14 had responded, out of which 7 were medical officers and 7 were the paramedical staff. In S.D.H (sub-district hospital) Narendranagar, 30 had responded, out of which 15 were medical officers and 15 were paramedical officers. In CHC Chamba, 10 had responded, out of which five medical officers and 5 were the paramedical staff. In D.H Baurari, 20 had responded, out of which 10 were medical officers and 10 were paramedical officers. In CHC Purola, 10 had responded, 5 were medical officers and 5 were paramedical officers. In CHC Nainidanda, 10 had responded, 5 were medical officers and 5 were paramedical officers. In CHC Barkot, 10 had responded, out of which 5 were medical officers and 5 were paramedical officers. In CHC Chinyalisaur, 10 had responded, out of which 5 medical officers and 5 paramedical officers. In D.H. Uttarkashi, 20 had responded, out of which 10 were medical officers and 10 were paramedical officers. In CHC Naugaon, 10 had responded, out of which 5 were medical officers and 5 were paramedical officers. In CHC Ghandiyal, 10 had responded, out of which 5 were medical officers and 5 were paramedical officers. In DH Chamoli, 20 had responded, out of which 10 were medical officer and 10 were paramedical officers. In CHC Thatyur, 10 had responded, out of which 5 were medical officers and 5 were paramedical officers. In CHC Khari, 10 had responded, out of 5 were medical, and 5 were paramedical. In CHC Pratap Nagar, 6 had responded, out of which 3 were medical officers and 3 were the paramedical staff. In S. DH Srinagar, 20 had responded, out of which 10 were medical officers and 10 were paramedical officers.

Table 1. Distribution of Staff in Hilly Hospitals

| Hospitals | District | Available Participants | Staff Category Frequency |
|----------------|-------------|------------------------|----------------------------------|
| CHC Pokhri | Chamoli | 10 | 5-Medical staff 5-Paramedical |
| CHC Ghat | Chamoli | 10 | 5-Medical staff 5-Paramedical |
| CHC Joshimath | Chamoli | 10 | 5-Medical staff 5-Paramedical |
| CHC Jakholi | Rudraprayag | 10 | 5-Medical staff 5-Paramedical |
| CHC Augustmuni | Rudraprayag | 10 | 5-Medical staff 5-Paramedical |
| CHC Gopeshwar | Chamoli | 10 | 5-Medical staff 5-Paramedical |
| CHC Chamba | Tehri | 10 | 5-Medical staff 5-Paramedical |
| CHC Purola | Uttarkashi | 10 | 5-Medical staff |

| | | | |
|-------------------|-------------|----|--------------------------------------|
| | | | 5-Paramedical |
| CHC Nainidanda | Pauri | 10 | 5-Medical staff 5-Paramedical |
| CHC Barkot | Pauri | 10 | 5-Medical staff 5-Paramedical |
| CHC Chinyalisaur | Uttarkashi | 10 | 5-Medical staff 5-Paramedical |
| CHC Thatyur | Tehri | 10 | 5-Medical staff 5-Paramedical |
| CHC Khari | Tehri | 10 | 5-Medical staff 5-Paramedical |
| CHC Pratapnagar | Tehri | 06 | 3-Medical staff 3- Paramedical |
| CHC Ghandiyal | Pauri | 10 | 5-Medical staff 5-Paramedical |
| CHC Naugaon | Uttarkashi | 10 | 5-Medical staff 5-Paramedical |
| S.D Karanprayag | Rudraprayag | 20 | 10-Medical Staff 10- Paramedical |
| S.D Narendranagar | Tehri | 30 | 15- Medical Staff 15- Paramedical |
| S.D Srinagar | Pauri | 20 | 10- Medical Staff 10-Paramedical |
| D.H Baurari | Tehri | 20 | 10- Medical Staff 10- Paramedical |
| D.H Rudraprayag | Rudraprayag | 14 | 7- Medical Staff 7- Paramedical |
| D.H Uttarkashi | Uttarkashi | 20 | 10- Medical Staff 10-Paramedical |
| D.H Chamoli | Chamoli | 20 | 10 Medical Staff 10- Paramedical |

This study showed that out of 300 samples 200(67%) participants knew HDC,180(60%) were aware of the HDC members, 200(67%) knew HDP, 180(60%) knew the HIRS system, 170(57%) knew about the functioning of HIRS, 210 (70%) knew the triage and 190 (63%) knew triage tags,230(77%) knew multiple communication systems, 260(86%) knew logistics supply, 280(93%) knew surge capacity, 250 (83%) knew contact list of all hospital staff, 250(83%) knew hospital safety guidelines, 280(93%) participants knew where to find disaster kit at the time of emergency,230(77%) participants knew earthquake disaster preparedness, 250(83%) participants knew alternative supply of electricity used in their hospital,225(75%) participants knew about satellite phones. 210(70%) participants knew fire exit arrows placement,210 (70%) participants knew of fire exit plans,210(70%) participants knew NOC to be taken from the fire department, 280(93%) participants had the knowledge of usage of fixed heavy almirahs to prevent from falling at the time of earthquake disaster (shown in fig1).

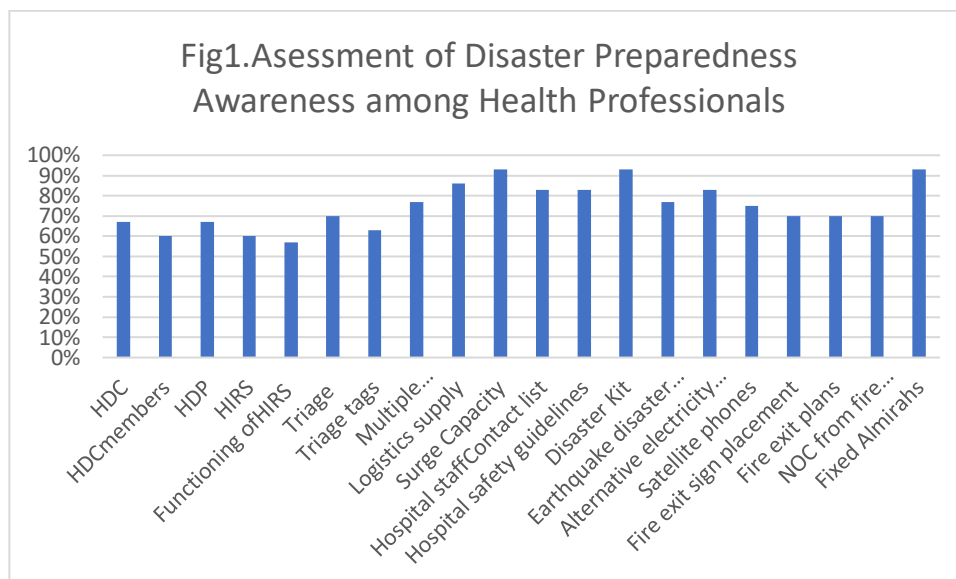


Table2. showed that 300 participants had 71% of knowledge regarding disaster preparedness.

Table2 . Knowledge results of 300 participants

| Number of Participants (n=300) | Knowledge score(%) |
|--------------------------------|--------------------|
| 170 | 100% |
| 10 | 85% |
| 10 | 80% |
| 10 | 70% |
| 10 | 50% |
| 15 | 45% |
| 5 | 35% |
| 10 | 20% |
| 10 | 15% |
| 20 | 10% |
| 20 | No Knowledge |

Table 3. COMPARISON OF KNOWLEDGE REGARDING DISASTER PREPAREDNESS BETWEEN MEDICAL & PARAMEDICAL STAFF

| Awareness on different topics | Medical | Paramedical | P-VALUE | CHISQ.T |
|--------------------------------|---------|-------------|----------|---------|
| HDC | 55% | 45% | 0.01 | 6 |
| HDC member | 56% | 44% | 0.02 | 5.4 |
| HDP | 55% | 45% | 0.01 | 6 |
| HIRS | 56% | 44% | 0.02 | 5.4 |
| HIRS work | 59% | 41% | 0.02 | 5.4 |
| Triage | 58% | 42% | 0.00016 | 14.2 |
| Triage tags | 58% | 42% | 0.00038 | 12.6 |
| Multiple communication system | 52% | 48% | 0.17 | 1.84 |
| Logistics supply | 50% | 50% | 1 | 0 |
| Surge Capacity | 50% | 50% | 1 | 0 |
| Contact list of Hospital staff | 52% | 48% | 0.12 | 2.4 |
| Hospital safety guidelines | 52% | 48% | 0.12 | 2.4 |
| Disaster kit | 50% | 50% | 1 | 0 |
| Earthquake preparedness | 52% | 48% | 0.17 | 1.84 |
| Alternative electricity supply | 52% | 48% | 1 | 2.4 |
| Satellite phones | 56% | 44% | 0.000865 | 11.096 |
| Placement of fire exit sign | 57% | 43% | 0.00016 | 14.2 |
| Fire exit plans | 57% | 43% | 0.00016 | 14.2 |

| | | | | |
|-----------------------------|-----|-----|---------|------|
| Heavy Items should Be fixed | 50% | 50% | 1 | 0 |
| NOC from fire department | 57% | 43% | 0.00016 | 14.2 |

Table 4. showed 150 medical participants had 82% of knowledge regarding disaster preparedness.

Table 4. Knowledge results of 150 medical participants

| Medical | Knowledge % |
|---------|-------------|
| 100 | 100% |
| 10 | 85% |
| 10 | 70% |
| 5 | 40% |
| 5 | 35% |
| 10 | 15% |
| 10 | 10% |

Table 5. showed 150 paramedical staff had 68% of knowledge regarding disaster preparedness.

Table 5. Knowledge results of 150 paramedical staff

| Paramedical Participants | Knowledge % |
|--------------------------|--------------|
| 70 | 100% |
| 10 | 95% |
| 10 | 65% |
| 10 | 50% |
| 10 | 45% |
| 10 | 35% |
| 10 | 20% |
| 10 | 15% |
| 10 | No knowledge |

4. Discussion:

- Doctors and paramedical staff had significant variations in knowledge of hospital disaster committee (HDC) and HDC members, as it was found $p < 0.05$.
- Doctors and paramedical staff had significant variations in knowledge of hospital disaster plans (HDP), as it was found $p < 0.05$.
- Doctors and paramedical staff had significant disparity in HIRS and its working, as it was found $p < 0.05$.
- Doctors and paramedical staff had significant variations in knowledge of triage and triage tags, as it was found $p < 0.05$.
- Doctors and paramedical staff had no significant disparity in the knowledge of multiple communication systems, logistics, and surge capacity, as it was found $p > 0.05$.
- Doctors and paramedical staff had no significant variation in knowledge of the contact list and hospital safety guidelines, as it was found $p > 0.05$.
- Doctors and paramedical had no significant variation in knowledge of disaster kits, earthquake disaster preparedness, and alternative supply of electricity, as it was found $p > 0.05$.
- Doctors and paramedical staff had significant variations in knowledge of satellite phones and placing heavy almirah fixed, as it was found $p < 0.05$.
- Doctors and paramedical staff had significant variations in knowledge of fire exit plans, arrow placement, and the requirement of NOC from the fire department, as it was found $p < 0.05$.

Hence, it was found that medical staff had significantly more knowledge in disaster preparedness elements like hospital disaster committee, members, disaster plan, HIRS and its working, triage and its tags, satellite phones, alternative supply of electricity, fire exit plans, fire sign arrows 'placement and NOC from fire department than paramedical staff.

CONCLUSION:

This study showed that the participants had 70% of knowledge regarding disaster preparedness. Out of the hospital staff, doctors had good knowledge of disaster preparedness.

In disaster management, all healthcare workers should have good knowledge regarding disaster preparedness.

Doctors and paramedical staff are the first saviors so they play an important role in disasters. Proper training and skills are required to deal with any emergency effectively [14].

This study assessed that paramedical staff had to be more aware of HDC, HDC members, HDP, Triage, Triage tags, HIRS system, and its functioning, satellite phones, and preparedness against fire disasters.

The plan should be designed in such a way so that it carries out educational programs efficiently and could help health professionals to enhance their knowledge. This knowledge would help them to handle crises effectively [7]. Training should be provided regularly in all hospitals.

The factors that influence the desire for additional training should work on it. This could help hospitals to create targeted training and educational materials and would help the healthcare system to be better prepared so that it could respond effectively and efficiently during a disaster [1]

An important step towards disaster preparedness is that medical and paramedical staff should be aware of all plans and procedures in a mass casualty event [5].

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