IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 16, Issue 6 Ver. V (June. 2017), PP 94-99
www.iosrjournals.org

Disaster Awareness And Preparedness Among Community Member in A Rural Mountainous Setting in the Western Himalayas

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Abstract: *The level of community disaster awareness and preparedness is of Paramount importance. This enables the community to respond better to disasters thus reducing loss of property and lives. This study aims at identifying the level of disaster awareness and preparedness of communities in the vulnerable areas of the Himalayan valley and its risk factors. A cross sectional study was conducted to meet the study objectives among the general population of ten identified villages in the Naggar block of Kullu district. A semi structured questionnaire was used to collect information on basic disaster awareness and preparedness. A total of 192 participants consented to be a part of the study and returned completely filled survey forms. In the univariate analysis factors such as age, gender, education level, occupation and participants who had previously not faced disasters were independently associated with poor disaster awareness and preparedness. After adjusting for confounders, age >36 (AOR 2.5, 95%CI 1.02-6.3) and participants who had not faced any disasters (AOR4.02, 95%CI 1.94-8.36) were significantly associated with level of disaster awareness and preparedness. This study is a first of its kind that attempts to look at the community preparedness for disasters in a vulnerable area that is prone to natural calamities such as flash floods, earthquakes and landslides. Due to acute paucity of literature further studies are warranted in this area.*

I. Background and Introduction

India due to its geo-climatic conditions has been a traditional "hot-spot" of various natural disasters. Natural disasters such as earthquakes, floods, flash floods, cyclones, landslides etc have been a recurrent phenomenon throughout the year in some part of the country. According to the Disaster Management Report, 2005, in the decade 1990-2000, an average of about 4344 people lost their lives and about 30 million people were affected by disasters every year.(1) The loss and damage to property both private and public has been colossal and usually unaccounted for.

Kullu district in the state of Himachal Pradesh has a unique geography with mountainous terrains and about 90% of its population living in rural areas situated in far-flung and inaccessible areas. (2) The community especially in an inaccessible terrain is an important stakeholder in the disaster preparedness and management. Assessing the level of disaster preparedness in the community will enable the policy makers to raise awareness and educate the community on preparing themselves in times of disaster.

This study aims at identifying the level of disaster preparedness of communities and risk factors for the same, in the Manali subdivision of Kullu district.

II. Materials And Methods

This survey was conducted as a part of a project undertaken by the Lady Willingdon Hospital, Manali towards training and capacity building in disaster preparedness in the community. As a part of the training programme, a base line survey on disaster preparedness was done at the community level. Of the ten selected villages in which these training sessions were conducted over a period of ten days, every consecutive participant who attended these sessions were invited to participate in the study.

III. Survey Instrument

In the absence of a validated Questionnaire, a survey tool was developed in English after a through literature search. This tool was then translated to Hindi and then back translated to English to test for reliability. It was then pilot tested, necessary changes were made before it was used for data collection. The modified Hindi questionnaire was used to collect data on various domains of disaster preparedness. 25 questions on basic disaster awareness and preparedness were asked. The questionnaire was administered in Hindi. Those who could not read or write were assisted in filling the questionnaire. Members of the training and capacity building team were oriented about the survey instrument. Verbal consent and information on the survey was given to the participants prior to the administration of the questionnaire. Any doubts while answering the questionnaire were addressed by the team. A scoring system was developed based on the answers of the participants. The maximum possible score was 25. Disaster knowledge and preparedness were categorised as "poor", "moderate" and

"good". The project undertaken by the mission hospital for which this survey was done was funded by the Deputy Commissioner's Office, Kullu district.

IV. Results

Of the 400 participants who took part in the teaching and capacity building sessions, 210 consented to be part in the survey, of which 192 gave back completely filled questionnaires that were included in the analysis.

Socio demographic profile of the participants

The mean age of the study population was 36 years, with almost equal proportion of men and women (94, 49% & 98, 51%). Almost 82% of the participants (157) were educated primary level or more. There were 71 (37%) housewives while 51 (26.6%) were unemployed, 53 (27.6%) were either farmers or shop owners in this population. Further details can be seen in table 1.

Table 1- Participant characteristics in the survey

Patient characteristics	Category	n	%
Age	<=25	60	31.2
	26-35	42	21.9
	36-45	31	16.1
	46-55	29	15.1
	56-65	16	8.3
	>=66	14	7.3
Gender	Male	94	49
	Female	98	51
Education level	Illiterate	35	18.2
	Primary	31	16.1
	Secondary	31	16.1
	Middle	63	32.8
	High/ secondary high	23	12
	Graduate and above	9	4.7
Occupation level	Unemployed	51	26.6
	House wife	71	37
	Unskilled /semi skilled	5	2.6
	Skilled	6	3.1
	Farmer/ shop owner	53	27.6
	Professional	6	3.1

Disaster preparedness and knowledge survey

According to the survey only 62 participants (32%) felt that they were prepared for disaster while only 38(20%) knew the basics of first aid in this group. About 30% of the people said they knew how to use the fire extinguisher but only 11% knew if there was at least 1 fire extinguisher in the village. Only 5 (2.6%) participant knew about triaging during a disaster. Details of other responses are given in table 1.

Table 2- Disaster Preparedness and Knowledge Survey, key questions

No	**Survey question**	**Response(n=192)**			
		Yes	**%**	**No**	**%**
1	Do you know what a disaster is?	155	80.7	37	19.3
2	Have you ever discussed disaster preparedness with your family?	52	27	140	72
3	Do you think your family is disaster prepared?	62	32.2	130	67.7
4	Do you know the basics of first aid?	38	19.7	154	80.2
5	Do responsible members of your family know basics of first aid?	48	25	144	75
6	Are all your important family records/ documents kept safe?	101	52.6	92	47.9
7	If in a disaster you cannot return home have you thought of a safe place to meet?	54	28.1	138	71.8
8	Do you in your village have at least 1 fire extinguisher?	21	10.9	171	89.0
9	Do you know how to use a fire extinguisher?	56	29.2	136	70.8
10	Have you kept out of village contact numbers to be contacted during a disaster?	88	45.8	104	54.2
11	Do you understand the "triage"?	5	2.6	187	97.4
12	Can you stabilise a patient before help arrives?	37	19.3	155	80.7
13	Do you have emergency contact numbers in your house?	75	39.1	117	60.9

15	Do you have emergency contact numbers in your village?	86	44.8	106	55.2
16	Do you know any disease that may spread after a disaster?	33	17.2	159	82.8

When asked about "what would your reaction be if their house is on fire?" Almost 41% of the respondent said that they will try to put it under control while 40% said they would not know what to do. Very few (4.6%) said they will call the fire brigade or other emergency services. (Figure 1) When asked about what their reaction would be if their village was on fire, the responses were similar with only 9.4% calling the emergency services and 36% saying that in such a situation they would not know what to do. (Figure 2)

Figure 1-Reaction of participants if their house was on fire

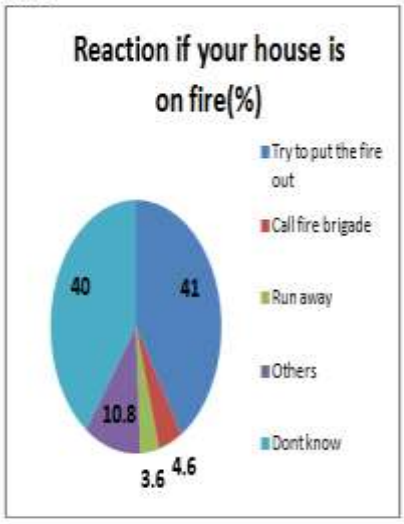
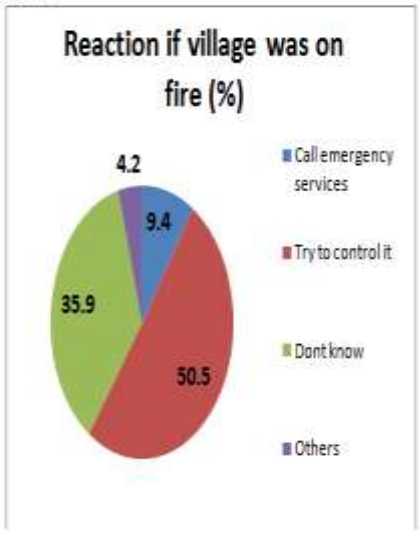


Figure 2-Reaction of participants if their village was on fire



77(40%) of the respondents identified their kitchen, while 41(21%) said that the wood storage place within the house was a potential hazardous site. Only 77(40%) could identify hazardous sites in the village. (Table 3)

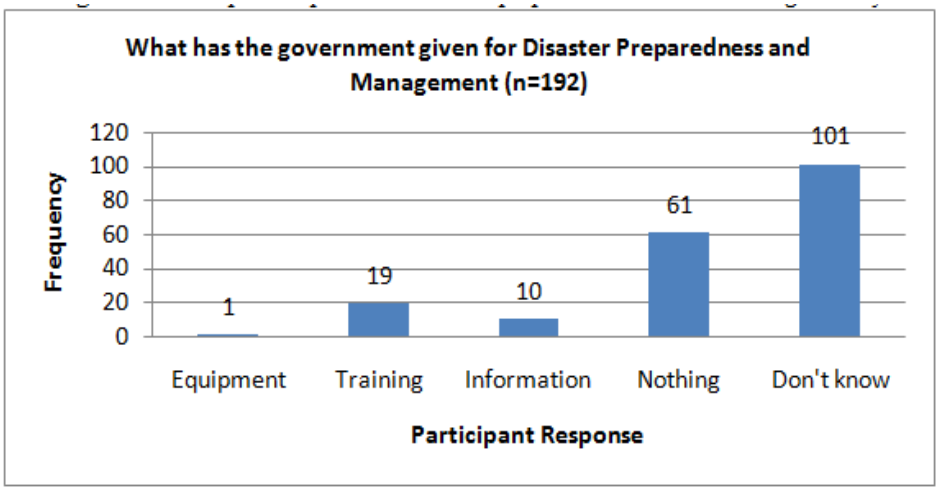
Table 3- Answers to specific questions in the survey

Survey Question	Category	n	%
Potential hazardous sites in the house?	Kitchen	77	40.1
	Near Tandoor *	26	13.5
	Wood storage area	41	21.4
	House is safe	5	2.6
	Don't know	43	22.4
Are there hazardous sites in your village?	Yes	77	40.1
	No	115	59.9

**Tandoor- heating system used in the winters; works by burning fire wood.*

When asked what the government had given for disaster preparedness and management at the village level, 101 (52.6%) participants said they did not know while 61(31.7%) said that nothing was done in their village. (Figure 4)

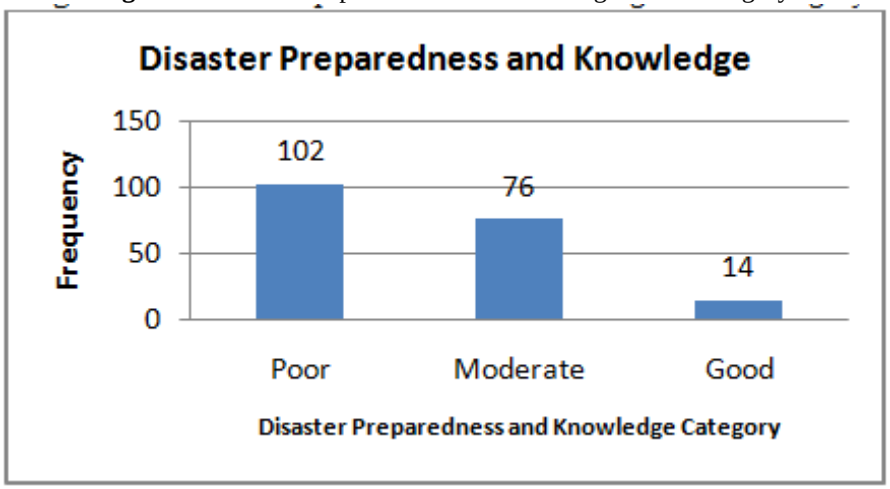
Figure 4- Participant response in Disaster preparedness and Knowledge survey



Disaster knowledge and Preparedness Score

The minimum score obtained in the survey was 1 while the maximum score obtained was 24. The median score was 9(SD 4.7). A score of <9 was considered "poor" while that of greater than 9 was considered "adequate". The "adequate" category was later dichotomised as "moderate" and "good" using 18 as a cut off. Around 90 (47%) had adequate knowledge and were disaster prepared. 102(53%) had poor knowledge 76 (39.5%) had moderate while 14 (7.2%) had good disaster knowledge and preparedness. This is represented in figure 5.

Figure 5- Disaster Preparedness and Knowledge Score Category



Risk factors for poor knowledge and disaster preparedness

For the purpose of risk factor analysis, disaster knowledge and preparedness was used dependant variable and was dichotomised as "poor" and "adequate" based on the mean score of 9 (SD4.7). Patient characteristics and response to key survey questions were considered as independent variables and were analysed using chi tests. Factors such as age, gender, education level, occupation and participants who had previously faced disasters were independently associated with poor knowledge for disaster knowledge and preparedness ($p<0.05$) as shown in table 4. In the multiple logistic regression after adjusting for age and gender, age >36 (AOR 2.5, 95%CI 1.02-6.3) and participants who had not faced any disasters (AOR4.02, 95%CI 1.94-8.36) were significantly associated with poor disaster knowledge and preparedness.

Table 4- Factors associated with Disaster Knowledge and Preparedness

Variable	**Category**	**Disaster knowledge and preparedness score**		**OR**	**P value**	**AOR**	**95% CI**	**P Value**
		Poor Knowledge	**Adequate Knowledge**					
Age	>36	56	30	2.43	**0.003**	**2.5**	**1.0-6.3**	**0.04**
	<=36	46	60					
Gender	Female	60	38	1.95	**0.022**	1.2	0.57-	0.55

	Male	42	52				2.82	
Education	Up to primary	46	20	2.87	**0.001**	2.17	0.86-5.5	0.09
	Secondary and above	56	70					
Occupation	Unemployed /housewives	72	50	1.92	**0.031**	1.97	0.80-4.8	0.13
	Other occupations	30	40					
Previously faced disaster?	No	80	50	2.90	**0.001**	**4.02**	**1.94-8.36**	**0.00**
	Yes	22	40					

V. Discussion

Earthquakes due to its sudden nature cause catastrophic damage both to life and property. The Manali subdivision lies in the sensitive Himalayan belt, at the juncture of two active tectonic plates, the region being prone to severe seismic activity. It falls in Zone V, the highest seismic zone.(2) Flash floods, short lived extreme events, occurring due to moving or stationary thunder storms are a common disaster in the Manali subdivision. Landslides have also been identified as a common geographic hazards common to this region. These are simply defined as the mass movement of rock, debris or earth down a slope and have come to include a broad range of motions whereby falling, sliding and flowing under the influence of gravity dislodges earth material. The Commandant Home Guards, Kullu, have identified specific areas in the subdivision prone for these activities.(2) Manali subdivision experiences regular snowfall in the winter months of December to March. Burning of firewood is a major source of heat during these winter months and thus firewood becomes an important resource which people store in plenty in their houses. This along with wooden houses and dry cattle feed becomes a major source of fire hazard.

There has been a gradual shift in the country in the strategies used for disaster management, from the rescue and relief model to the integration of disaster mitigation at all levels of disaster management planning in the last few years. This includes capacity building leading to preparedness and readiness to tackle disasters at the community level itself.(3) This shift arises out of the belief that investing in strategies based on mitigation is much more cost effective than expenditure on relief and rehabilitation. (1)

Disaster preparedness has been described as "The knowledge and capacities developed by governments, professional response and recovery organizations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions." (4) This is based on analysing disaster risk, identifying potential hazards, assessing community vulnerability and capacity building of the community to respond to these needs. Disaster preparedness and planning in the civil administration and public system plays an important role not only in the relief and rescue but also in reducing the impact of these disasters.(5) However the role of the community has not been adequately emphasised in the preparedness and planning process. Community level disaster preparedness is a major component of community health promotion.(6) This includes activities such as contingency planning, stockpiling of equipment and supplies, the development of arrangements for coordination, evacuation and public information, and associated training and field exercises.(4) Strategies that involve the community participation have been shown to improve disaster preparedness.(7)

This study was a part of training and capacity building of the community towards natural disaster. Out of the 192 survey participants only 62(32.2%) said they were disaster prepared while only 52(27%) ever discussed disaster preparedness with the family. These are not satisfactory numbers as most participants have not included "disasters" as an important aspect of family emergency, preparedness and management. Also 154(80.25%) of the participants do not know the basics of first aid. In this study age >36 years (AOR 2.5, $p<0.05$) stood out as a significant risk factor for poor disaster preparedness and knowledge. This could be due to higher level of education, awareness and mobility in the comparatively younger age group. Also, community members who had previously not faced disaster (AOR 4.02, $p <0.05$) had higher odds for poor disaster and preparedness scores. This could be due to the fact that people who had experienced a disaster first hand could relate to the event and scored better as compared to the people with no previous disaster experience.

In a rural community where geographic accessibility to health care during emergencies and natural disasters may be influenced by the climate and terrain this is a poor finding. These findings highlight the need to promote a culture of disaster preparedness and also to educate the community on methods to support personal disasters and emergencies.(6) In a systematic review published in 2014 it was observed that disaster education of teenagers by combining theoretical and practical activities in school, family, community, and self-education programs translates into better survival knowledge , knowledge of skills and adaptive behavioural changes.(8) Given the current status of disaster preparedness and knowledge in this community it will be beneficial to establish disaster teams and public education at the community level in villages. (9) (10). Also, there is a paucity of literature on disaster from the developing world considering that 85% of disasters and 95% of disaster-related

deaths occur in the developing world, the overwhelming number of casualties has contributed insignificantly to the world's peer-reviewed literature.(11) This warrants the need of more scientific research in this area in the developing world that may influence policy decision.

VI. Conclusion

This study is the first of its kind in the disaster prone area of the Himalayas. There is limited disaster awareness and preparedness prompting the need of community sensitisation and information transfer in this area. A community that is aware and prepared will respond better in times of crisis. However further research is also needed to corroborate the findings of this study as there is acute paucity of literature from the developing world that is overwhelmed by disasters and disaster related casualties.

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