



**KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING DISASTER PREPAREDNESS  
AMONG HEALTH CARE PROFESSIONALS: A CROSS SECTIONAL STUDY IN A  
TERTIARY CARE TEACHING, RESEARCH AND REFERRAL MEDICAL INSTITUTE IN  
SOUTH INDIA**

**Hospital Administration**

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**ABSTRACT**

**Background:** Disaster management occupies an important place in this country's policy framework as it is the poor and the under-privileged who are worst affected on account of calamities /disasters. Hospital disaster management provides the opportunity to plan, prepare and when needed enables a rational response in case of disasters/ mass casualty incidents. Disasters and mass casualties can cause great confusion and inefficiency in the hospitals.

**Method:** A descriptive cross-sectional study was conducted amongst 168 health Care Professionals. A self-administered questionnaire was used to assess the knowledge, attitude and practice regarding Disaster preparedness and management. Descriptive analysis was used to analyse the qualitative variables. Comparison of knowledge and attitude among groups of different cadres was done with the help of One sample kolmogorov-smirnov test, kruskal wallis test while chi-square and p Values were also calculated to check the significance in the difference in knowledge or attitude.  $p < 0.05$  was considered statistically significant.

**Results:** Out of 168 Health Care Workers (HCW's), 38(22.6 %) were Doctors, 46(27.6%) were Nurses, 48(28.6%) were Technicians and 36(21.4%) belonged to Administrative staff. Among individual groups, nursing staff showed the highest level of knowledge followed by doctors, administrative staff and lastly technicians. The difference was found to be significant as chi square test revealed. Chi square=31.519 and p value<.001. Maximum positive attitude is found to be amongst doctors followed by administrative staff, nurses and least positive in the technicians and differences in the attitude was found to be significant (chi square =31.466, p value =<.001). Although almost everyone agreed that drills should be done regularly but 70% of the participants didn't know whether drills are done at their hospital or not

**Conclusion:** This study reflected about the lack of sound knowledge among the Health Care Workers regarding Disaster Preparedness and management. Although the attitude of the staff was found to be positive about the need of disaster plan, it's timely update, conducting drills and training programmes, it was found that the hospital did not have any training or awareness programs for the staff.

**KEYWORDS**

Disaster Preparedness, Knowledge, Attitude, Practice, Health Care Workers.

**INTRODUCTION**

Disaster is sudden calamitous event bringing great damage to the society in the form of loss of property, goods and most importantly life. 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<sup>1</sup>.

Hospitals may face both internal and external disasters. The impact of internal disasters such as fire, exposure to hazardous material, utility failures, etc., is typically limited to the hospital/ healthcare facility while external disasters include scenarios such as earthquakes, mass casualty events or epidemics where the hospital itself may or may not be affected but is a critical part of the larger response.

Disaster management occupies an important place in this country's policy framework as it is the poor and the under-privileged who are worst affected on account of calamities /disasters. Hospital disaster management provides the opportunity to plan, prepare and when needed enables a rational response in case of disasters/ mass casualty incidents. Disasters and mass casualties can cause great confusion and inefficiency in the hospitals<sup>3</sup>.

A well prepared, well informed hospital will already know what is needed and will be able to provide crucial information and will effectively implement essential relief programmes<sup>4,5</sup>. The first step towards making hospitals safe is to create awareness among various stakeholders about the need to have safe hospitals, what it entails and actions that can be undertaken.

This study aims to assess the Knowledge, Attitude and Practice (KAP) about disasters among Health-Care Workers (HCW's) at Nizams Institute of Medical Sciences, a tertiary care teaching, research and referral medical institute in a South Indian city, Hyderabad. This exercise was undertaken prior to the preparation of comprehensive Disaster Management Plan/Manual for the institute which is mandatory for government hospitals in India as per "Disaster

Management Act, 2005".

**METHODOLOGY**

A prospective cross-sectional, descriptive study was carried out in the institute's teaching Hospital from January 2015 to September 2015. The questionnaire was self-administered and contained both open and close ended questions.

The study population includes doctors (Faculty, Senior Residents & Junior Residents), Staff nurses, technicians, and other paramedical staff like pharmacists, Technicians etc.

By stratified random sampling the questionnaire was distributed among 300 participants and results were analyzed through SPSS 16.00 version software & Microsoft excel. For quality assurance pre-testing of questionnaires was done and required modifications were carried out accordingly.

Comparison of knowledge and attitude among groups of different cadres was done with the help of One sample kolmogorov-smirnov test, kruskal wallis test while chi-square and p Values were also calculated to check the significance in the difference in knowledge or attitude.

The descriptive analysis was done in the form of numbers, percentage and frequency for the purpose of evaluating Knowledge, Awareness and Practice and also drill conducted. The results were compiled in easily comprehensible forms of tables and graphical representations.

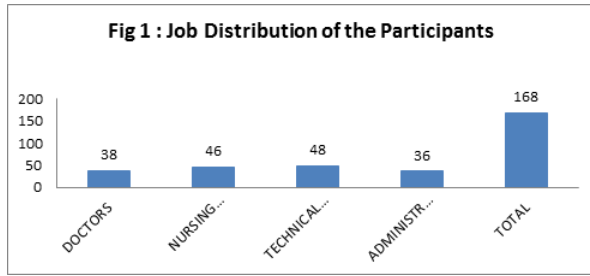
**RESULTS**

Out of 300 study population, 182 participants were had responded. Hence response rate was 61% that comes out to be satisfactory. Out of these 182, 14 forms were discarded because of being either incomplete or incorrect. Thereafter rest 168 questionnaires were analyzed.

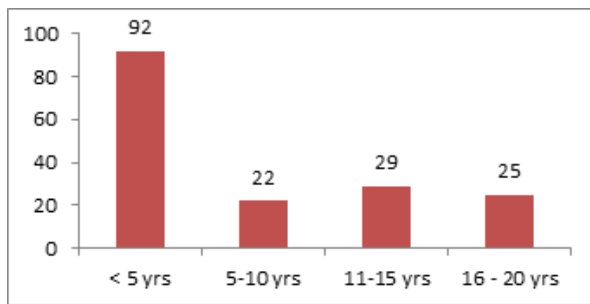
The questionnaire was divided into four sections:

Section 1 - Demographic details (4 questions)  
 Section 2 - Knowledge based questions (8 questions)  
 Section 3 - Attitude based questions (10 questions)  
 Section 4 - Knowledge about current practice based questions (6 questions)

**SECTION 1**



The participants were distributed in four groups, Doctors, nursing staff, technicians and administrative staff. Out of 168, 38(22.6%) were Doctors, 46(27.6%) were Nurses, 48(28.6%) were Technicians and 36(21.4%) belonged to Administrative staff represented in Figure 1. Doctors include the faculty, senior residents and junior residents while nursing staff included the assistant nursing superintendents, sister in charges and staff nurses posted in emergency department. Technicians included OT, E.C.G and laboratory technicians posted in the emergency department while administrative staff included Medical Social Workers, P.R.O's and personal of support services i.e. Central Pharmacy, Central Sterile Supply Department and clerical staff of the hospital.



**Fig 2: Distribution of Health Care Workers according to the period of their Job in the Institution**

Figure 2 gives a distribution of HealthCare Workers according to the period worked in hospitals. This shows that 54.8% of them had worked for less than 5 years followed by 17.3% working for 10-15 years. Only 14.9% had worked for 15-20 years followed by 13.1% who had worked for 5-10 years. This illustrates that most of the respondents were working for less than 5 years.

**SECTION 2**

**Tab 1: Definition of Disaster**

Disaster is	Frequency	Percent
1. A Catastrophe	D=9	7.1
	N=0	
	T=3	
	A=0	
2. Adverse happenings usually occurring suddenly and unexpectedly	D=0	7.7
	N=2	
	T=5	
	A=6	
3. An event causing loss of human life/property out of proportion	D=0	1.8
	N=2	
	T=1	
	A=0	
4. All	D=29	83.3
	N=42	
	T=39	
	A=30	
<b>Total</b>	<b>168</b>	<b>100.0</b>

• Where, D=Doctors, N=Nursing, T=Technician, A=Administrative Staff.

Table 1 shows that out of 168 participants, 140 (83.3%)HCW's were aware of the definitions of disaster i.e. replied all the definitions of

disaster correctly, Among individual groups, nursing staff was having highest(91.3%) percentage of these who know all the correct definitions of disaster while only 29 (76.3%) Doctors were aware of all the definitions of disaster. The difference in the knowledge of individual groups was found to be significant as the chi square=31.881 and P value came out to be<.001.

**Tab 2: Questions related to knowledge of healthcare workers regarding disaster.**

Question	Yes n (%)	No n (%)	
1. Do you know what a disaster plan is?	68(40.3)	100(59.5)	
			D=25(65.8)
			N=28(60.9)
			T=3(6.2)
2. Do you know where to find it?	70(41.7)	98(58.3)	
			D=13(34.2)
			N=35(76.1)
			T=11(22.9)
3. Do you know what drills are?	103(61.3)	65(38.7)	
			D=26(68.4)
			N=38(82.6)
			T=15(31.2)
4. Do you know your functions during drills?	90(53.5)	78(46.4)	
			D=18(47.4)
			N=38(82.6)
			T=16(33.3)
5. Do you know what disaster preparedness is?	106(63.1)	62(36.9)	
			D=32(84.2)
			N=39(84.8)
			T=19(39.6)
6. Do you know what a disaster kit is?	95(56.5)	73(43.5)	
			D=26(68.4)
			N=33(71.7)
			T=21(43.8)
7. Do you know where to look for disaster kit?	135 (80.4)	33(19.6)	
			D=29(76.3)
			N=44(95.7)
			T=37(77.1)

• Where, D=Doctors, N=Nursing, T=Technician, A=Administrative Staff.

Table no.2 shows that the knowledge regarding disaster was assessed with the help of the questionnaire viz. where to find disaster plan, what drill are their functions during drills what is disaster preparedness and what is disaster kit etc. The knowledge among health care workers as a whole and among individual group was assessed.

**Tab 3 : Chi Square Test & P-value of the knowledge questions**

SL NO.	Question	Chi Square	P Value
1	Do you know what a disaster plan is?	42.147	< .001
2	Do you know where to find disaster plan?	32.063	< .001
3	Do you know what drills are?	28.327	< .001
4	Do you know your functions during drills?	24.271	< .001
5	Do you know what disaster preparedness is?	33.341	< .001
6	Do you know what a disaster kit is?	24.271	= .005
7	Do you know where to look for disaster kit?	10.253	=.017

For the assessment of comparison of level of overall knowledge among groups of different designations i.e. Doctors, Nurses, Technicians and Administrative staff. Knowledge scoring was done. With the help of normality test, named as One-Sample Kolmogorov -Smirnov Test it was found the data to be asymmetric or skewed for each group.

**Tab 4 : Knowledge scoring done by one sample Kolmogorov test of individual group**

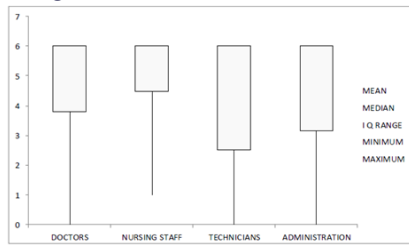
Designation	Mean	Median	I Q range	Minimum	Maximum
Doctors	3.7895	4.000	2.25	.00	6.00
Nursing	4.495	6.000	2.00	1.00	6.00
Technicians	2.5208	1.5000	4.00	.00	6.00
Administration	3.1667	3.000	4.00	.00	6.00

Designation	N	Mean rank
Doctors	38	85.97
Nursing	46	114.93
Technicians	48	61.51
Administration	36	74.71

The knowledge scores of individual groups was compared with the help of Kruskal-Wallis Test and Mean Rank of every group was calculated. Among individual groups, Nursing staff showed the highest level of knowledge followed by Doctors, Administrative staff and lastly Technicians as shown in table below. The difference was found to be significant as chi square test revealed. Chi square=31.519 and p value<.001.

**Fig 3: Knowledge Score Of Healthcare Workers**



**Section 3: Attitude**

In this section questions were related to the attitude of healthcare workers towards disaster preparedness in the hospital. The attitude of the healthcare workers was assessed by asking them ten questions regarding disaster preparedness and disaster management, Attitude was given positive and negative marking on the basis of reply in form of agree or disagree. For example the attitude was marked positive if the participant agreed to the statement that management should be adequately prepared if disaster occurs and also if they disagreed that I do not need to know about disaster planning and vice-versa.

The results show that almost all the healthcare workers are having positive attitude regarding knowing disaster plan, it is necessary to update it frequently, and that the hospital should be adequately prepared for any disaster and training is necessary for all. Disaster drills are necessary.

Among groups, maximum positive attitude was found among nurses i.e. 44(95.7%) and least positive among technicians i.e.32 (66.7%) about knowing disaster plan. It was found that all the Doctors (100%) agreed and only 26 (54.2%) Technicians agreed that management should be adequately prepared if any disaster occurs. Out of 168 HCWs, 112 (66.7%) showed positive attitude i.e. they disagreed with the fact that disaster planning is for few in hospital. Among individual groups, maximum doctors i.e. 29 (76.3%) had positive attitude that disaster planning is for few in the hospital while only 20 (41.7%) technicians disagreed to the same question. 134(79.8%) of the HCW's had positive attitude to that the potential hazards likely to cause disaster should be identified and dealt with i.e. agreed.

As shown in the Table No. 5, again maximum number of doctors i.e. 37 (97.4%) and least number of technicians i.e. 15 (31.2%) had positive attitude towards identifying the potential hazards which are likely to cause disasters. 155 (92%) HCWs had positive attitude towards training being necessary for all i.e. agreed to the fact that training is necessary for all. Almost everyone including all the doctors and nurses (100%) were quite enthusiastic and had positive attitude regarding the same while only 38(19.2%) technicians showed positive attitude.

**Tab 5 : Attitude of the Healthcare workers**

Question	Negative				positive				unsure			
	D	N	T	A	D	N	T	A	D	N	T	A
1. I do not need to know what a disaster plan is.	18(10.7)				140(83.3)				10(6.0)			
2. Management should be adequately prepared if any disaster occurs.	5(13.2)	2(4.3)	8(16.7)	3(8.3)	33(86.8)	44(95.7)	32(66.7)	31(64.1)	-	-	8(16.7)	2(5.6)
3. disaster planning for a few in hospital	13(7.7)				139(82.7)				16(9.5)			
4. potential hazards likely to cause disaster should be identified and dealt with.	2(4.3)	11(22.9)	-	38(100)	41(89.1)	26(42.2)	34(94.4)	-	-	3(6.5)	-	2(5.6)
5. Training is necessary for all.	5(3.0)				155(92.3)				8(4.8)			
6. Do you think it is necessary to have a disaster plan?	7(4.2)				152(90.5)				9(5.4)			
7. Disaster plans need to be regularly updated?	6(3.6)				140(83.3)				22(13.1)			
8. Disasters are unlikely to be in our hospital?	42(25.0)				100(59.5)				26(15.5)			
9. Disaster management is only for Nurses, & Doctors?	6(3.6)				152(90.5)				10(6.0)			
10. Drills should be done frequently?	21(12.5)				132(78.6)				15(8.9)			

Where, D=Doctors, N=Nursing, T=Technician, A=Administrative Staff.

100% of Doctors and Nurses, 34(94.4%) of administrative staff and 34 (70.8%) technicians agreed to have disaster plan for the institution i.e. showed positive attitude. Positive attitude was found highest among Doctors and Nursing staff (>90%). While only 30 (62.5%) technicians agreed to the same and had least positive attitude Maximum number of doctors disagreed that disasters are unlikely in hospital i.e. 31 (81.6%) and least number of technicians i.e. 21 (43.8%) disagreed to the same.

There was a strong disagreement against disaster management being only for Nurses and Doctors. Out of 168 HCWs, 152 (90.5%) HCWs had positive attitude that disaster management is not only for doctors and nurses. Among individual groups, as shown in Table No 3, all the Doctors (100%) had positive attitude i.e. disagreed to that disaster management is only for doctors and nurses, and only 37 (77.1%) technicians disagreed to the same. 132 (78.6%) HCWs had positive attitude i.e. agreed towards conducting the drills frequently while other 12.5% disagreed and showed negative attitude. As per Table No 5, among participants highest positive attitude was found amongst administrative staff, i.e.34 (94.4%) and least in technicians i.e.25 (52.1%) that drills should be conducted frequently.

However the data was found to be asymmetric and skewed. one sample kolkomoroy smirnov test was applied to test the normality of the data which revealed the skewness of the data and more attitude which showed the following results:

**Tab 6: one sample kolkomoroy smirnov test**

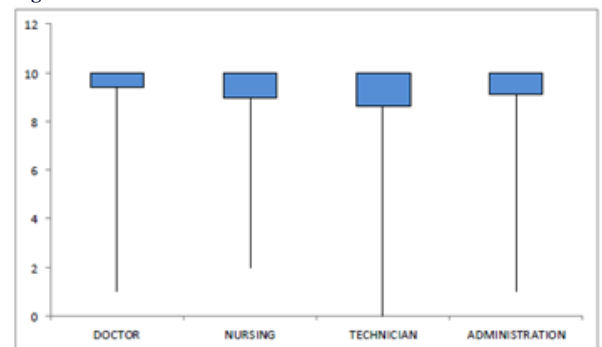
Designation	Mean	Median	I Q Range	Minimum score	Maximum score
Doctors	9.41	10.00	1	8	10
Nurses	8.95	9.00	2	5	10
Technicians	86.54	7.00	5	0	10
Administration	9.10	9.00	1	7	10

Designation	N	Mean Rank
Doctors	38	104.08
Nursing	46	97.64
Technician	48	53.29
Administration	36	88.65

The attitude score of individual groups was compared with the help of Kruskal – Wallis test. This showed the maximum positive attitude amongst doctors followed by administrators, nurses and least positive in the technicians and differences in the attitude was found to be significant (chi square=31.466, p value =<.001)

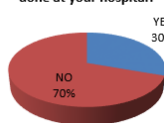
**Fig 4: Attitude Score Of The Healthcare Workers**



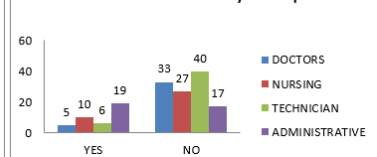
**SECTION 4 : PRACTICE**

The questions on practices were to determine if participants knew if disaster drills are done at hospital. If done what type of drills were done, if there is any ongoing training given to the staff and whether the disaster plan was periodically updated or not

**Fig 5 : Are Disaster drills done at your hospital?**

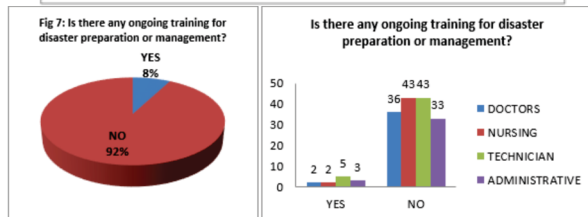
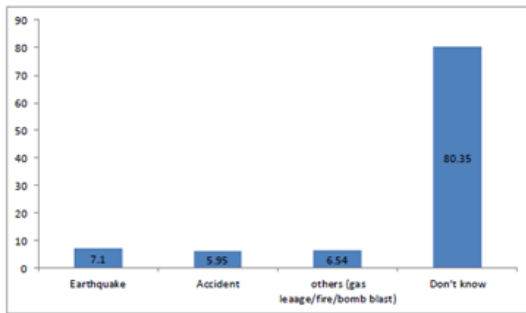


**Are Disaster drills done at your hospital?**

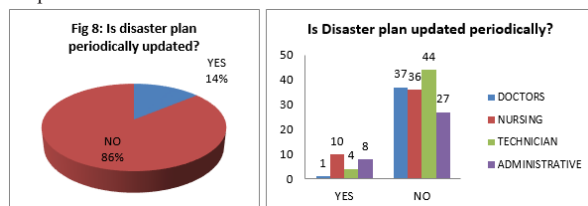


Although almost everyone agreed that drills should be done regularly but 70% of the participants didn't know whether drills are done at their hospital or not (Figure 5) further as shown in Figure 6 , 80.3% of the participants didn't know that what type of drills is done at the hospital while around 7 % said that earthquake mock drills are done followed by others (gas leak/ fire/ bomb blast etc.)

**Fig 6 : Type of drills**



As shown in figure 7, 92% of the participants were unaware whether there is any ongoing training for the disaster preparation or management in hospital or not.



Similarly as shown in Figure 8, around 86% of the participants didn't know whether disaster plan is updated periodically or not.

**LIMITATIONS**

The study included a few faculty and more of senior & junior residents among doctors but couldn't include many senior faculty members.

**CONCLUSION**

Maximum healthcare workers were found to be working for less than 5 years of work span which could be a reason for lack of sound knowledge among them regarding hospital disaster preparedness and management. The nursing staff and doctors were mostly aware regarding the disaster, drills, disaster preparedness and disaster kit while knowledge regarding the same was deficient in the administrative staff and the technicians.

Although the attitude of the staff was found to be positive about the need of disaster plan, its timely update, conducting drills and training programmes, but it was found that the hospital did not have any training or awareness program for the staff. The staff agreed that the hospital should have a training program and drills to be necessary. However practices were deficient, work still needs to be done in this regard. Thus to conclude the study, it was analyzed during the study that at NIMS Hospital, Hyderabad Health care workers are having a fair amount of knowledge , very positive attitude towards disaster preparedness.

The Disaster Management Committee of the Hospital should be formed and it should meet at least every three months as per recommendations made by the NDMA (National Disaster Management Authority) Guidelines and assessment of management done in previous disasters/disaster drills should be conducted. Regular training and awareness program for the healthcare workers are essential to improve knowledge regarding preparedness and management of disasters.

**Source of Funding:** Nil

**Conflict Of Interest:** None.

**Ethics approval and consent to participate:**

The study was conducted after obtaining written informed consent from all the participants with prior permission from Institute Ethics committee.

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