



An Intervention Study on The Knowledge and Training Needs of Disaster Medicine Among Medical Students in Puducherry

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ABSTRACT

Background: Disaster relief and assistance are mainly carried out by medical rescue teams, which are constituted of health professionals. The study was conducted to assess effect of training methods to create awareness and impart training regarding disaster management among medical student.

Methods: An intervention study was under-taken, interviewing 150 medical students. Intervention was done using lecture, posters and videos on disaster simulation drills. Evaluation was conducted using the same questionnaire following the intervention. The pre- and post-test evaluation were compared and analyzed.

Results: The study showed lower levels of knowledge on disaster management. Following the intervention there was a significant rise in the knowledge levels. The demand survey revealed the students' willingness to learn more about the disasters and fill their gaps in knowledge.

Conclusion: Traditional clinical-oriented medical education might lead to a huge gap between the knowledge level on disaster medicine and the current needs of disaster preparedness. Continuing medical education plans on disaster medicine via media should be practice-oriented, and take the knowledge levels and training needs into consideration.

Key words: Disaster management, Medical students, Coastal area, Intervention study, Demand survey.

INTRODUCTION

Disaster medicine is the area of medical specialization serving the dual areas of providing health care to disaster survivors and providing medically related disaster preparation, disaster planning, disaster response and disaster recovery leadership throughout the disaster life cycle.¹ The intensity and frequency of natural and man-made disasters have been noticeably increasing all over the world. Hurricane, earthquake, flood, outbreaks of infectious diseases, nuclear leakage, oil spills and other disasters in recent years have caused huge economic losses, serious environmental disruption and lasting psychological impairment to the survivors.² While not all natural calamities can be predicted

and prevented, a state of preparedness and ability to respond quickly to a natural calamity can considerably mitigate loss of life, loss of property, human suffering and restore normalcy at the earliest.³ Disaster medicine training, an integrated part of efficient disaster preparedness is vital for health professionals to develop comprehensive skills.⁴ In the wake of a disaster, resources are scarce or even non-existent, sources of communication may be limited and physicians and other healthcare professionals are working under stressful conditions for which they have not received adequate training.⁵ Irrespective of the legal consequences, studies show that a large percentage of healthcare professionals are willing to provide medical care in response to a disaster, however most believe they are not properly

trained to do so.⁶ Thus the issue is how do we ensure that the highest possible quality of care is provided in response to a disaster event? The answer lies in providing increased training and education to healthcare professionals on how to better respond in advance to any disaster event. Such preparation and training may include performing simulated disaster exercises and drills.⁷ Some researches on disaster medicine have mainly been conducted in developed countries while data from developing countries like India are scarce.⁸⁻¹¹

OBJECTIVES

To evaluate knowledge levels on disaster management among medical students, to conduct a demand survey for training needs assessment in improving their disaster management skills, to create awareness as well as train them regarding disaster management and to compare the pre- and post-test on disaster management knowledge levels of medical students in Puducherry.

MATERIALS AND METHODS

An intervention study at Puducherry was undertaken in a government medical college among the pre-final year medical students who were learning community medicine as one of their university exam subjects. It was a batch of 150 students and all of them were included in a study period of two months from June to August 2016. A pre-tested & validated structured questionnaire was used for face-to-face interview among the pre-final year students, the questionnaire included questions on knowledge levels, demand survey and training needs assessment on disaster management. Following the pre-test interview, an intervention was organized based on the training needs assessment and demand survey results. The intervention mainly focused on the important aspects of disaster management and also on the topics preferred by the students which were in the form of lectures, posters, and videos on disaster simulation drills and practical basic life support. Evaluation was done following the intervention by post-test interview among the pre-final year students with the same questionnaire excluding the demand survey and training needs assessment part. The evaluation was held after an interval of four weeks following the intervention to avoid bias. The pre- and post-test evaluation was compared and analyzed.

Data entry and analysis were done using MS Excel 2010 and SPSS 17 software respectively. Descriptive statistics was used to express the demographic details of the participants. Paired t-test was used to test for significance in pre-and post-test scores.

Written informed consent was sought and confidentiality was ensured. Institute scientific research as well as institute ethical committee approval was obtained.

RESULTS

The study was conducted among 150 pre-final year students. Among which around one-third of the students were males (32.6%) and 67.3% were females.

Knowledge levels on disaster management: The study results showed that the most common source of acquiring information regarding disaster management was newspaper (61.3%), television and radio (53.3%) followed by school education (28.6%). More than three-fourth (86%) in the study participants had not attended disaster management awareness campaigns earlier. It was found that around half of the students had a moderate level of knowledge on disaster medicine prior to the start of the study when they were asked for self-estimation. About 85% of the students did not have a systematic learning on the topic of disaster medicine. Four-fifth of the students surveyed had experienced a disaster. Most of the students had knowledge about Tsunami (93.3%), first aid kits (92.6%), emergency exit (92%), and cyclone (92%). Almost 88.6% of the medical students had known about onsite treatment of disaster management. (Table 1).

Table 1: Knowledge levels on disaster management among medical students (n=150)

Knowledge Levels*	Frequency (%)
Emergency numbers	90 (60)
Emergency Exit	139 (92.6)
Disaster kit	53 (35.3)
First aid kit	140 (93.3)
Fire extinguishers	3 (2)
Onsite treatment	133 (88.6)
Triage	69 (46)
Epidemic prevention	93 (62)
First aid skill	127 (84.6)
Trauma Treatment	88 (58.6)
Cardio-pulmonary resuscitation	48 (32)
Post-traumatic stress disorder	35 (23.3)
Earthquake	104 (69.9)
Tsunami	143 (95.3)
Cyclone	138 (92)
Fire	117 (78)

*Multiple responses

Demand survey: Almost all students felt that it is necessary to learn about disaster medicine. When asked about the most preferred method of learning on disaster management 81% of the students opted for handouts, 31.3% preferred national textbooks

and around 10 % thought foreign materials would be a better method of learning. More than half of the students were willing to participate in the disaster management drills and around all of them felt that a volunteer team should be set up for disaster relief also 82% of them were ready to join the volunteer team. First aid skills were found to be the most important topic in disaster medicine learning for 86% of the students followed by triage, evacuation and referral accounting for 68% and post-disaster epidemic prevention by 55.3%. (Table 2).

Training needs assessment: When asked about the topics of interest in disaster medicine one fourth of the students' interest was treatment principles and first aid skills, 18% opted triage and around 17 % chose role of field hospitals in disaster assistance as their topic of interest. (Table 3).

Comparison of pre- and post-test: The total average score percentage of the pre-test on knowledge levels about disaster management was obtained as 63.3%. After the intervention the knowledge levels of the medical students was re-assessed and the average score percentage post intervention was found to be 95.6% (Table 2). A paired t-test was done between the pre-and post-test scores and the difference were found to be statistically significant (p<0.05). (Table 4).

Table 2: Demand survey on training needs on disaster management among the medical students

Demand Survey	Frequency (n=150) (%)
Willingness to participate in disaster drills	
Yes	147 (98)
No	1 (0.7)
Does not matter	2 (1.3)
Preferred Methods of Learning	
Handouts	121 (81)
National textbook	47 (31.33)
Foreign materials	16 (10.66)
Willingness to attend drills	
Willing to participate regularly	48 (32)
Willing to participate occasionally	88 (58.6)
Not willing to participate	8 (5.3)
Does not matter	6 (4)
Setting up a volunteer team	
Should be set up & willing to participate	124 (82)
Should be set up but not want to participate	25 (16.6)
Should not be set up	1 (0.6)
Important topics in disaster medicine learning*	
Fundamental principle	72 (48)
Disaster disposal	33 (22)
First aid skills	129 (86)
Triage, evacuation and referral	102 (68)
Post disaster epidemic prevention	83 (55.3)
Post disaster psychological disorder	40 (26.6)
Disaster medical supervision	36 (24)

*Multiple responses

Table 3: Training needs assessment on disaster management among medical students

Training Needs*	Frequency (n=150) (%)
National and local disaster reduction plans and preparedness against disaster	20 (13.3)
Humanitarian responsibility in disaster disposal	18 (12)
Basic principles of disaster assistance	23 (15.3)
Role of modern information technology in disaster assistance	22 (14.6)
Role of field hospitals in disaster assistance	26 (17.3)
Rear support hospitals' tasks and preparation in disaster assistance	17 (11.3)
Treatment principles and first-aid skills	36 (24)
The rescue and transport of the wounded	23 (15.3)
On-site triage	27 (18)
Traffic accidents	19 (12.6)
Earthquakes	20 (13.3)
Fire disaster	22 (14.6)

*Multiple responses

Table 4: Comparison of pre- and post-test scores using paired t-test

Pre-test & Post-test	Values
Mean difference (SD)	-9.70 (3.32)
Std. Error Mean	0.271
95% CI of the Difference	-10.23 - -9.165
t value	35.814
P value (2-tailed)	0.000*

*Depicts that there is a significant difference in the pre-test and the post test scores at 0.000 level of significance; CI= Confidence Interval

DISCUSSION

The motive of the study was to assess the knowledge levels of the medical students regarding disaster management and also their suggestions on training needs. The study was conducted among medical students since they are going to be the key frontline workers in the defence mechanism of disaster management. In the current study it was found that the most common source of acquiring information about disaster management was media which was in consistence with the results of a study

done on knowledge and perception of secondary school students about natural disasters in Belgrade, Republic of Serbia by Cvetković VM et al.¹² Al Thobaity et al, in their study on perceptions of knowledge of disaster management among military and civilian nurses in Saudi Arabia cited that majority of participants perceived that they had acquired knowledge and skills on disaster management through disaster drills and participation in continuing education courses.¹³ More than half of the students felt they had moderate knowledge on disaster preparedness, around one-third of the students felt they had little knowledge on disaster preparedness and only 10% of the students felt they were having good knowledge on disaster preparedness according to their self-estimation of knowledge on disaster preparedness. A similar study on disaster preparedness among Hong Kong nurses by Fung O.W et al, reported the study participants' perceptions of their own preparedness for disasters, which showed about 65% of the participants were prepared in some ways, around one-third participants had not prepared at all and only 3% were confident of their own preparation for disasters.¹⁴ More than half of the students answered the emergency numbers correctly. Major part of the students had knowledge on the emergency exit, first aid kits and onsite treatments which were similar to the findings of the study done in China.² A similar study on "knowledge, attitudes and practices of health care workers regarding disaster preparedness" in South Africa by Moabi RM, cited that majority of them knew what a disaster is, around three-fourth of the participants knew where to find the disaster plans, most of them were aware of disaster plans.¹⁵ Meanwhile in the present study only one third of medicos were aware of disaster kit and less than 5% of the students had knowledge on fire extinguishers. Questions related to triage, trauma treatment and post disaster epidemic prevention had been correctly answered by only half of the students which was low in comparison with the Shanghai study.² About one fifth of the medical students in our study had answered correctly for Post-traumatic stress disorder which was again lower than that of the Shanghai study.² With regards to the disasters, the students had adequate knowledge on earthquake, tsunami, cyclone which is correlating with the results from previous literature.² Only three fourth of the students surveyed had good knowledge on fire accidents which was lower than the Shanghai study.² Only 14 % of the students had attended any kind of disaster awareness campaigns earlier. In contrast to this a study by Osman NN on "Disaster management: Emergency nursing and medical personnel's knowledge, attitude and practices" in Malaysia showed that about three-fourth of the participants had attended disaster education/training earlier and nearly half of the participants had

involved in disaster response in their past.¹⁶ The total average score percentage in the current study for the pre-test was calculated to be 63%. Following the pre-test, an intervention was organized based on the demand survey results. The intervention mainly focussed on the important aspects of disaster medicine and topics selected by the medical students that were in the form of lectures, posters, and videos on disaster simulation drills and practical basic life support. After the intervention the knowledge levels of the students was re-assessed and the average score percentage of the post-test was found to be 95%. There was a huge hike in the score when compared to the pre-test. A paired t-test was done between the pre- and the post-test scores to check for the significance in the rise of the values. The results showed that there is a rise in the post-test scores compared to the pre-test at 0.000 level of significance. From the post-test scores we could infer that education plays an important role in enriching the knowledge and increase the awareness on disaster medicine. Alim et al, have conducted a similar evaluation study on disaster preparedness training and disaster drill among nursing students in Indonesia in which the pre-test score was 9.84 and the post-test score was 14.46 with a significant difference in the pre and post-test scores ($p=0.001$).¹⁷

The demand survey about the training needs of the medical students related to disaster medicine results implied that almost all students felt that disaster medicine education is necessary. Another study done by Ibrahim FA on "Nurses knowledge, attitudes, practices and familiarity regarding disaster and emergency preparedness" in Saudi Arabia, revealed that around three-fourth participant nurses from that study agreed to the need of knowledge about disaster plans and majority felt training was necessary for all healthcare team.¹⁸ The most preferred method of learning in the current study was found to be practical training followed by videos. Based on this result we used lectures and videos on the practical training of disaster medicine, first aid skills and cardiopulmonary resuscitation for our intervention. Majority of the students preferred hand-outs as the teaching material for studying about disaster management whereas in the Shanghai study, National textbooks was the most commonly preferred teaching material.² Based on this result we prepared hand-outs on topics of first aid skills, disaster preparedness for earthquake, fire accidents, cyclone and tsunami that were used as a part of intervention. Nearly one-third of the students surveyed were willing to attend the disaster simulation drills regularly and more than four fifth of the students felt that a volunteer team for the disaster relief has to be set up and that they would like to be a part of it. This again displays the students' interest in learning about disaster medicine and also their

positive attitude towards practising it. In demand survey the students chose first aid skills, post-disaster epidemic prevention, disaster disposal as important topics in disaster medicine learning. Based on these results emphasis was more on those topics. When asked about topics of interest regarding disaster medicine learning, first aid skills turned out to be the most common topic of interest, followed by triage.

CONCLUSION

The current study reflected a gap in the knowledge level on disaster medicine among the medical students. The demand survey revealed that the participants were willing to learn more about the disasters and fill their knowledge gaps. Following the intervention, there was a significant raise in the knowledge level on disaster medicine among the students. This infers that by educating and training the medical students who might be a part of the future disaster rescue teams, we could expect better disaster preparedness and response from them resulting in reduction of mortality and morbidity occurring due to the disasters.

LIMITATIONS

The study had certain limitations. The sampling technique used "Convenient sampling" for selection of individuals is a non-probability sampling technique. Furthermore, the study involves smaller sample size which limits the generalisability of the study.

RECOMMENDATIONS

The present study provided essential data concerning knowledge level and training needs among the medical students' who would be involved in disaster rescue teams in the future. From a health education perspective, disaster training programs are urgently needed, with specific emphasis on certain contents, such as psychological relief and administrative skills.

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