HEALTH SCIENCE

EDUCATIONAL NEED ASSESSMENT FOR EMERGENCY AND DISASTER RESPONSE COMPETENCIES AMONG DOCTORS AND NURSES IN KATHMANDU, NEPAL

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Abstract: A cross-sectional descriptive study was conducted to assess the educational and training needs and professional competencies of doctors and nurses in disaster response in four hospitals of Kathmandu, Nepal which were purposively selected. Self-administrated semi-structured questionnaire adopted from American College of Emergency Physicians Tools was administrated to the all doctors and nurses for data collection. Most of the doctors (83.3%) and nurses (75.4%) have experienced on natural disaster and academic curriculum was found to be the major sources of disaster response knowledge for both doctors and nurses. Very limited (9.7%) of doctors and 15.7% of nurses told that disaster curriculum was applicable in real life settings. First aid, triage and evacuation and disaster preparedness were the three major trainings needs for both professions. Less than half of doctors and nurses i.e. 47.5% and 40.7% respectively told that they are not confident in handling disaster response. Curriculum for doctors and nurses should focus on clinical decision-making. Disaster medicine trainings for all types of hazards, improving and pile stocking of logistics, self-realization of limitation in disaster response will help in responding to national and community disasters.

Key Words: Disaster Medicine Knowledge, Disaster medicine training, Needs Assessment, Doctors, Nurses, Kathmandu, Nepal

1. Introduction

Disaster medicine and disaster medical response has a long history and largely predicted its evolution over last 200 years basically from the military models. Generally, it is assumed to be started from the "ground zero" and proceeding to recovery and care of casualty that again proceeds backward to hospital.

Disaster medicine and disaster medical response is complex however essential for every society [1]. It can be said disaster medicine knowledge as a combine form of clinical knowledge and performance to reduce the death and injuries due to disaster. During disaster all individual doctors have an obligation to provide urgent medical care due to their commitment to provide care for the sick and injured [2]. Doctors and Nurses comprises the crucial part of the crisis team who serves to achieve the best possible level of health for the individuals and communities. However, both of them should know their limitations in knowledge, skills, abilities, independence, and self-efficacy before a crisis, so that they can play an effective expected role in the critical situations by the modification of these restrictions [3]. Globally there is a growing concern about the technical standards and competencies of medical teams/ health professionals in disasters. The study hypothesized that the updated disaster training and curriculum will have positive influence in the disaster response of doctors and nurses. Hence, there is a shortage of, and need for, quantitative, empirical research into the primary skills required for physicians involved in international disaster response [4]. To help doctors and nurses to act effectively in the crisis situation, government should maintain an essential surge capacity at different local and national level. For example, high-income countries

have established Rescue 112 as an emergency medical care system which played a crucial role in responding and managing medical emergencies such as injuries, trauma and other life-threatening conditions during crisis [5]. All the professionals involve in search and rescue, Emergency Medical Services, hospitals, fire brigades, etc. must be trained to practice standards of care with competency-based specialized knowledge and skills in crisis situations. The competency gaps in the disaster response professionals must be integrated into training programs by enabling them competent in their specific area of work. Similarly, Hyogo Framework emphasizes the transfer of knowledge and skills for effective response to disasters and strengthen disaster preparedness activities at all levels [6]. In 2003, the Association of American Medical Colleges (AAMC) and the Institute of Medicine jointly published report encouraged the early introduction of bioterrorism topics in medical school which became the first to integrate vertically the bioterrorism curricula into all 4 years of medical education. Soon after the publication of this report, in 2004, 104 of 125 medical schools of United States reported that they have included "Biological/ Chemical Terrorism" in one or more required medical school courses [7]. The 9/11 terrorist attack in United States, have lead many countries realization of the significance of disaster medicine training. One of the studies explain that the

contemporary emergency events; like in United States (e.g., September 2001, school shootings), Europe (e.g., Madrid train bombings), and the Middle East have raised awareness of the need for improving the disaster response skill on mass casualty events. [8] The other study shows that disaster readiness program is limited in both the academic and service sectors and those which exist is mainly based upon consensus rather than competency and is price prohibitive. The study also revels the finding that the country needs it's all nurses and health care providers absolute access to high-quality, evidence-based, competency-driven education and training programs in disaster response [9].

Among 2279 staff members who were contacted, 1812 (79.6%) completed the survey. The vast majority of respondents valued the MET. Working in a surgical vs. medical ward and having participated in either the MET educational program (MET al course) or MET interventions were associated with better acceptance of the MET system. Reluctance by nurses to call the covering doctor first instead of the MET for deteriorating patients (62%) was significantly less likely in those working in surgical vs. medical wards or having a higher seniority or a MET al certification (OR 0.51 [0.4-0.65], 0.69 [0.47-0.99], and 0.6 [0.46-0.79], respectively). Reluctance to call the MET in a patient fulfilling calling criteria (21%), was less likely to occur in medical doctors vs. nurses and in surgical vs. medical ward staff, and it was unaffected by the MET al certification. The MET was well accepted in participating hospitals. Nurse referral to the covering physician was the major barrier to MET activation. Medical status, working in surgical vs. medical wards, seniority and participation in the MET al educational program were associated with lower likelihood of showing barriers to MET activation [10,11].

Scope of the study:

Nepal serves as a Hot Bed for almost all type of disaster due to its distinct geographical structure and unstable steep slopes. In the global disaster index Nepal ranked at 4th, 11th, and 30th in terms of vulnerability to climate change, earthquake, and flood respectively. Similarly, in terms of hazard related deaths globally Nepal ranks at 23rd position. In August, 2013, Nepal Health Sector Support Program publish a report on human resource for health in Nepal which shows that many of the professional development training courses of doctors and nurses, are under-subscribed and a high proportion (55%) of health professionals were trained on safe delivery, maternal and reproductive health subjects (1,839/3,318) in 2012/13 [12]. This statistic clearly speaks that there is scarcity in the disaster response in-service training.

Researchers suggested that the disaster training should include training from basic medical

education for students, standard guidelines, following systematic protocols, such as the Incident Command System to manage disasters [13]. Idrose et al found that the participants' knowledge of disaster plans increased significantly through the combination of lecture, simulation, and video training effectively [14]. With respect to type of disaster, individual physician should be able to take appropriate advance measures, including obtaining and maintaining suitable knowledge and skills to provide medical services when needed [15]. Djalali et al have point out the insufficient education and training in disaster preparedness in health system of EU. International community appeal for the promoting and enhancing of the disaster medicine training capacity as one of the 'call-to-action requirements' [16]. Doctors, nurses, midwives and paramedics are trained to use a variety of procedural skills which are significant component of clinical practice. No systematic analysis has been done for the examination of the preparedness and competency of individual health care providers during large-scale disaster response. As a result, very little is known about the need of knowledge, procedural skills and competency and requirement of professional competency depending on the disaster conditions [17].

Government of Nepal has developed the National Strategy for Disaster Risk Reduction to response to disaster and resilient community which however talks about the coping and reducing effects but weak in defining the educational and training need of the team. World Health Organization has conducted Initial Public Health risk assessment in Nepal after 2015 earthquake which states that, the appropriate medical and surgical treatment of injuries improves the survival chances, minimize future functional impairment and disability and ensure as full a return as possible to community life. Therefore, the priority must be given to providing emergency medical and surgical cares to affected people immediately after the event [18]. Very less study was found on the educational and training need assessment of doctors and nurses in disaster response in Nepal. So, this cross-sectional descriptive study aims to collect, explore, and describe background data on educational, training need and professional competencies of doctors and nurses in disaster response of public and private hospitals of Kathmandu.

2. Materials and Methods
2.1 Study Participants, Data Collection Methods and Tools

The study was conducted in the four different hospitals (2 public and 2 private hospital) of the Kathmandu, Nepal. Kathmandu is the capital of Nepal and is the largest city in the country with 1.26 million population according to World Population Review 2017 which accounts for 8.3 percent of Nepal's total population.Many well equipped private, community hospital,

teaching hospitals and Nepal's central hospitals all are located in Kathmandu [19]. The study was cross-sectional descriptive study. Four different hospitals (two public and two private hospitals) of Kathmandu that provides consent for the study were included in the study. A set of structured self-administered questionnaire in native language was distributed to the doctors and nurses of these four different hospitals. All the doctors and nurses in those four hospitals were approached and those who agreed and provided written consent were asked to complete a self-administered questionnaire which have 31 questions on demographic characteristics (sex, age, years of experience as a doctor and nurse), the previous experience in disaster and post disaster situation, disaster type, trained on disaster medicine, awareness of national and local disaster plan, hospital emergency management plan, surge capacity, communication channel, patient management during disaster. A set of 200 self-administered questionnaire was distributed to the doctors and nurses available in the hospital of which total of 80 doctors and 81 nurses (161 participants) participated in the study which reports the response rate of 80.5%. Separately the response rate of doctor was 80% and nurse was 81%. Five-point rating scale was used to identify the confident level of doctors and nurses in disaster response. Questions were mostly focused to identify the knowledge and practice of doctors and nurses of four different hospitals of Kathmandu, Nepal. This assessment tool was mostly adopted based on American College of Emergency Physicians tools. The questions included close and open-ended questions with multiple choice question and Likert scale where needed. Open ended questions were asked to gain the information on the specific educational need, recommendations to increase health worker's disaster response competencies. The tool was pretested with 10% sample in one of the hospitals of Kathmandu and Cronbach alfa (85%) was calculated for testing the reliability of the tools. The practicing doctors and nurses of these selected hospital were included in the study while the medical and nursing students were not asked to fill the form. No personal identifier were collected in the study and data was only in accessed with researcher.

2.2 Analysis

All the completed data was coded and entered in excel. Data cleaning was conducted in excel and then data was exported to Statistical Package for Social Sciences version 24. Cross tabulation was done for selected variables for the study and also comparison was made between knowledge and preparedness of doctors and nurses in public and private hospitals. A median score of 12 for both doctor and nurse was used as cutoff point for assessing the confident of doctors and nurses for dealing with any sorts of emergencies. All the completed data

was coded, entered and analyzed in SPSS 24 and relevant frequencies and cross-tabulation were made for relevant variables.

3. Results

3.1 Background Information

Table 1 shows that a total of 161 sample were collected as a representative sample which accounts for 80.5% of response rate. Almost equal participation has made by the doctors and nurses of both the public and private hospital i.e. public hospital (52.8%) and private hospital (47.2%).

Table 1: Hospital Type

Profession	Types of Hospital	
	Public n (%)	Private n (%)
Doctor	47 (58.8)	33 (41.3)
Nurse	38 (46.9)	(53.1)

3.2 Disaster Experiences by Professions

Table 2 shows the professionals (doctors and nurses) experienced to different sorts of disasters. It was noted that high number of doctors (i.e. 83.3%) had experienced in working in natural disaster while 76.7% have post disaster experience, very less proportion of doctor has experience in biological type of disaster i.e.10.0%.

High proportion of nurses i.e. 84.2% had worked in post-disaster setting followed by natural disaster working experience (75.4%). Like doctors, biological and chemical disaster experience comprise of small portion of the disaster response experience i.e.10.5% each biological and chemical disaster.

Table 2: Disaster Experience and Profession

Experience to Types of Disaster*	Profession	
	Doctor n (%)	Nurses n (%)
Natural Disaster	50 (83.3)	43 (75.4)
Chemical Disaster	10 (16.7)	6 (10.5)
Biological Disaster	6 (10.0)	6 (10.5)
Post Disaster	46 (76.7)	48 (84.2)

3.3 Sources of Disaster Medicine Knowledge

It was found that 55% of doctors responded curriculum as main source of disaster medicine knowledge followed by radio/ television as secondary source of disaster medicine knowledge for doctors. Friends (33.8%), journal/ article (30%), newspaper (28.8%) are other major source of information for disaster medicine. For the nurses, the response is not so different with curriculum as the

main source of disaster medicine knowledge i.e.55% followed by other means of information.

Table 3: Sources of Disaster Medicine Knowledge

Sources of Disaster Medicine Knowledge	Profession	
	Doctor n (%)	Nurses n (%)
Newspaper	23 (28.8)	32 (39.5)
Radio/Television	28 (35.0)	38 (46.9)
Journal Articles	24 (30.0)	23 (28.4)
Academic Curriculum	44 (55.0)	45 (55.6)
Friends	27 (33.8)	35 (43.2)
Others	17 (21.3)	18 (22.2)

3.4 Applicability of Disaster Curriculum in Practice

Of the total respondent 82% reported that there is disaster topic in the

Figure 1: Disaster Topic in Curriculum

curriculum. With regard to how extent the disaster topic is practical or useful during real practice only 12.9% reported that the curriculum is highly applicable while majority 81.8% thinks that the disaster topic is practical to some extent with some modification in the course. The finding is similar across the profession where most doctors (85.5%) and nurses (81.8%) reported that the disaster in curriculum is applicable to some extent to the real practice.
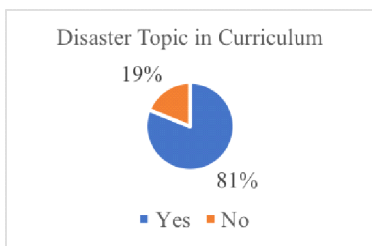
Table 4: Applicability of Disaster Curriculum in Practice

Level of Applicability	Profession	
	Doctor n (%)	Nurses n (%)
Highly Applicable	6 (9.7)	11 (15.7)
To some extent	53 (85.5)	55 (78.6)
Not Applicable	3 (4.8)	4 (5.7)

3.5 Self-Estimation of Disaster Knowledge

Analysis of the self-estimation of disaster knowledge was done to identify their own disaster medicine knowledge. The table shows that only 13.7% of the respondent reported having good disaster medicine knowledge while 59.6 percent thought that they have moderate knowledge and 26.7% thinks the disaster medicine knowledge they had is little. On crosstabulation across

the profession, only 13% of the doctors and 11.1% of the nurse thinks that they have good disaster medicine knowledge.

Table 5: Self-Estimation on Disaster Knowledge

Level of self-estimation	Profession	
	Doctor	Nurses
	n (%)	n (%)
Well	13 (16.3)	9 (11.1)
Moderate	48 (60.0)	48 (59.3)
Little	19 (23.9)	24 (29.6)

3.6 Disaster Needs Assessment for Doctors

Majority of the respondent reported the need of first aid training during disaster which accounts for 70% followed by the need of triage and evacuation (67.5%) and disaster preparedness (61.3%). However, psychological training need in post disaster, disaster supervision and disaster medicine training need also account for big portion which is 50%, 37.5% and 28.8% respectively. Similarly, some of the doctors feel the need of training on disaster type (22.5%) and epidemic control and prevention (4.3%). As almost all the doctors feel the need of disaster medicine training.

Table 6: Training Needs Assessment for Doctors

Training Needs Assessment	Yes	No
	n (%)	n (%)
First Aid	56 (70.0)	24 (30.0)
Epidemic control and prevention	37 (4.3)	43 (53.8)
Psychological Needs in post disaster situation	40 (50.0)	40 (50.0)
Triage and Evacuation	54 (67.5)	26 (32.5)
Disaster Medicine	23 (28.8)	57 (71.3)
Disaster Supervision	30 (37.5)	50 (62.5)
Disaster Preparedness	49 (61.3)	31 (38.8)
Types of Disaster	18 (22.5)	62 (77.5)

3.7 Training Needs Assessment for Nurses

Similarly, nurses were also asked on the need of disaster medicine training, majority of the nurses reported the need of types of disaster which accounts for 77.5% followed by the need of disaster medicine (71.3%), disaster supervision (62.5%), epidemic control and prevention (53.8%), psychological needs in post disaster (50%). Not the less but few of the nurses also feels the need of disaster preparedness (38.8%), triage and evacuation (32.5%), and first aid training (30%).

Table 7: Training Needs Assessment for Nurses

Training Needs Assessment	Yes n (%)	No n (%)
First Aid	61 (75.3)	20 (24.7)
Epidemic control and prevention	35 (43.2)	46 (56.8)
Psychological Needs in post disaster situation	35 (43.2)	46 (56.8)
Triage and Evacuation	51 (63.0)	30 (37.0)
Disaster Medicine	41 (50.6)	39 (48.1)
Disaster Supervision	11 (13.6)	70 (86.4)
Disaster Preparedness	44 (54.3)	37 (45.7)
Types of Disaster	24 (29.6)	57 (70.4)

3.8 Confident in Disaster Response

A Likert scale ranging from 1-5 was used ranging from 1 as a least confident to 5 as more confident. For identifying the readiness and confident of doctors and nurses in disaster response their readiness on national, local disaster response, triage preparation and psychosocial support during disaster were asked using Likert scale questionnaire. It was reported that only 52.5% of the doctors feel prepared and confident for the disaster response while almost equal percentage of the doctors feel not confident in disaster response (i.e.47.5%). While a little high portion of nurses were found confident than doctors which is 59.3% and remaining 40.7% of nurses feels no confident in disaster response.

Table 8: Confident level in Disaster Response

Profession	Not Confident n (%)	Confident n (%)
Doctors	38 (47.5)	42 (52.5)
Nurses	33 (40.7)	48 (59.3)

4. Discussion

Although there are many literatures discussing on the disaster education and training needs of doctors and nurses, no literature was found that specifically discuss on the disaster education and training need of the doctors and nurses of Nepal. This study aims to explore the specific disaster medicine education and training need of the doctors and nurses in public and private hospital of Kathmandu, Nepal. The main findings were majority of the doctors have experienced in working in disaster setting where majority of the nurses have post disaster experience. In response to the source of disaster medicine knowledge 55.3% of the respondent reported curriculum as the main source of disaster medicine knowledge which is same for the doctors and nurses of both type of hospital. Of the total respondent only 12.9% responded that the disaster curriculum is practical where the

majority responded the need of modification in curriculum. In 2012 an internet-based qualitative study was conducted which states similar that out of the total disaster management training only 61% had a competency-based curriculum design [6]. Approximately half of the doctor and nurse were trained which is not sufficient to perform timely and effectively medical disaster response. Although there is high number of doctors trained (56.3%) no significance difference (p=0.098) been observed in the disaster medicine training need between doctors and nurses. Moreover, majority of the responded suggested first aid, triage and evacuation and disaster preparedness as the most needed disaster educational and training need of doctors and nurses. This analysis is found similar when compared to public and private hospital. Apart from the formal disaster training (curriculum based) there is a need of comprehensive course focusing on disaster preparedness, clinical and non-clinical response with all hazards approach including terrorism and environmental related disasters for emergency physicians and trainees [20]. Similarly, in self-assessment of their disaster medicine knowledge only 13.7% of the respondent were found satisfied with the disaster medicine knowledge while other were not still feel gap in the knowledge. There might be large gap between the knowledge level on disaster medicine and current need

of disaster preparedness due to traditional clinical-oriented medical education. So, the health professionals and community residents should be timely and sufficiently trained for effective medical rescue [21]. It was also reported that the one who was experienced to work in disaster feels more confident and prepared in disaster response than the non-experience one but the experience in disaster is not found significant (p=0.774) to level of confidence to act in disaster response because there can be other factor that plays role like the timely competency based training, accountability, commitment, type of disaster, logistics, coming from the disaster background. No significant difference has been observed in the knowledge and experience of both professionals. Regarding the disaster training and simulation public hospital has been found more active than the private hospital. Doctors and nurses of the public hospital has observed to have high opportunity for the competency-based disaster medicine training hence found more confident than the private hospital.

The present study suffers from some limitations. The study was conducted in the capital city in most tertiary level hospitals so the findings may not be generalizable to peripheral lower level hospital.Also, the information was collected using self-administered questionnaire, there may be the problems in the reliability of the information provided by the respondents.

5. Conclusion

Doctors and nurses who are the primary responder of the victim during disaster need to be prepared for all type of disaster in both the public and private hospital. A set of standards of care during disaster can help to meet the expectations of disaster workforce. Hence, it can be concluded that there is need of standardize disaster medicine education and training. Both the curriculum of doctors and nurses should increase its focus on clinical decision-making content in both professionals. Issues on addressing the national, local community disaster response need could possibly increase by increasing the disaster medicine training for all type of hazards, improving and pile stocking of logistics, self-realization of the limitation in the disaster response and performing to fill the gap.

Author Contributions

A.B. developed the proposal; designed the tools for the study; conduct literature review; wrote the article. A.S collected data and applied the formal analysis; support in writing the article; reviewed the articles drafts. H.S supported in reviewing literatures, data analysis, and writing the articles All authors revised the final manuscript.

Conflicts of Interest

Authors declare no conflict of interest.

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