Disaster Medicine Training for Paramedics in Taiwan

Tzong-Luen Wang, MD, PhD; Hang Chang, MD, PhD

Abstract

To understand if paramedics training program has adopted disaster medicine, we reviewed the details of 2006 training program and analyzed the contents as follows. Sixty paramedic participants were enrolled to attend pre- and post-test. The associations between the contents of paramedic program and disaster medicine were determined by the consensus of three independent experts. The paramedic training included mainly five parts, that is, core lecture, hospital practice, case conference, ambulance practice and specific training course such as DMAT training course. The training course of disaster medicine has been mainly conducted in core lecture, case conference and DMAT training course. The total hours spent in disaster medicine training were about 30±3 hours that accounted for 8.4±2.2% of lecture hours. It also accounted for 3.6%±0.8% of total practice time. In addition, there is significantly better performance for these paramedics between pretest and posttest (65±10 points vs. 82±9 points, $P<0.05$). In conclusion, disaster medicine training has been implemented in paramedic training program and has also been proven to be useful in promoting their understanding of this field. However, it is also important to increase consistently the quality and quantity of the training.*(Ann Disaster Med. 2006;4:60-65)*

Key words: Disaster Medicine; Paramedics; Training; Education

Introduction

In Taiwan, disaster medicine training is implemented in the emergency physician residency program and post-graduate year one program that needs further improvement as shown in our previous study.[1,2] In contrast, there is abundant evidence described in the literature that emergency medical service (EMS) professionals lack training in public health and disaster response.[3-8] Reasons for this include lack of national standard EMS curricula components addressing disaster response, lack of education/training and equipment grants, and lack of a well-established role during a public health emergency.[9] However, it seems that there is no definite policy in build up the role of EMS and paramedics in disaster response in Taiwan as yet. The education and training for EMS and paramedics in the field thus lacks uniform and standard requirements.

It has been argued that public health agencies have not sought out EMS providers for training or continuing education because of the notion that the public safety and first responder

From Department of Emergency Medicine, Shin-Kong Wu Ho-Su Memorial Hospital, Taipei, Taiwan; Department of Medicine, Taipei Medical University, Taipei, Taiwan; Department of Medicine, Fu-Jen Catholic University, Taipei, Taiwan
Address for reprints: Dr. Tzong-Luen Wang, Department of Emergency Medicine, 95 Wen-Chang Road, Shin-Kong Wu Ho-Su Memorial Hospital, Taipei, Taiwan
Received: Nov 30 2005. Revised: Dec 6 2005. Accepted: Dec 15 2005.
TEL: 886-2-28389425 FAX: 886-2-28353547 E-mail: M002183@ms.skh.org.tw

community is not within the supervision of the health department in the United States.[9] In contrast, there is also good evidence that the EMS and public health system can cooperate well to provide higher ability of the health system to deliver the necessary emergency medical care to the public during disasters.[10-14] In other countries, paramedics can be authorized to administer vaccination and to provide decontamination, patient tracking and prehospital syndrome surveillance.[10-14] Because of the essential role in disaster response, both in the first hours (crisis management) and in the subsequent consequence management, paramedics should be well trained in some specific categories of disaster medicine.

In Taiwan, paramedics training have been developed for three years and continued to be modified. However, there are few investigations concerning the evaluation of disaster medicine training for the paramedics. We therein designed the following study to review the current training program of paramedics in aspects of disaster medicine in Taiwan.

Material and Methods

Paramedic training program

The 2005 paramedic training program is under the supervision of Fire Administration, Executive Yuan, Taiwan. The paramedic training included mainly five parts, that is, core lecture, hospital practice, case conference, ambulance practice and specific training course such as DMAT training course. These 5 components were implemented into 3 phases. This 3-phase program consists of 12 weeks of intensive, full-time classroom training (core lecture), followed by a minimum of 480 hours of supervised hospital clinical time (hospital practice, case conference and DMAT courses), and a minimum of 720 hours of supervised field internship with a paramedic ambulance service. Internships are available at a number of approved sites throughout the country. This nationally representative sample of paramedics included 60 candidates attending the course. Each candidate had to complete the entire course and fulfilled the criteria of passing all evaluation and tests.

Disaster medicine components

Basic disaster medicine training included

1. Introduction to National Disaster Medical System (NDMS)
2. Introduction of DMAT
3. Incident Command System (ICS)
4. Mass casualty incident (MCI) management
5. Principles of logistics
6. Field evaluation
7. Principles of public health
8. Refugee's care

Advanced disaster medicine training included:

1. Blast injury
2. Crushing syndrome
3. Compartment syndrome
4. Traumatic asphyxia
5. Particulate health problem
6. Post-traumatic stress disorder (PTSD)
7. Personal protective equipment (PPE) and decontamination

Pre- and post-training tests and questionnaires

Individuals were asked to indicate whether they had received training in the areas of weapons of mass destruction, nuclear/biological/chemical (NBC) responses, decontamination, terrorism before this course such as in EMT-I or EM-II training and continuing medical education

(CME) within previous 12 months. In addition, the candidates were asked to express if the ever underwent hands-on practice or simulation and tabletop drill in previous curricula. After the training course, the same questionnaire has been provided for each student for re-evaluation as a comparison.

On the other hand, each candidate was asked to do a 50-item pre-test. Each item is 1-in-4 single choice question and is assigned 2 points. The test covered the categories of weapons of mass destruction, nuclear/biological/chemical (NBC) responses, decontamination and terrorism. After completing the training course, each participant has to pass post-test that was completely different from pre-test but similar degree of difficulty. The performance in pre-test and post-test was compared and analyzed.

Statistical analysis

The categorical data were imputed in Microsoft Excel 2000 for descriptive statistics and further qualitative analyses using the chi-square test. The continuous variables were analyzed using ANOVA for inter-group differences. A $P < 0.05$ was considered to be statistically significant.

Results

Disaster medicine-related program

Of the 60 participants, 47 (78%) had experience of disaster medicine training in the last 12 months. Among these with recent learning of disaster medicine, 29 (60%) completed basic and advanced disaster training, and 32 (68%) ever attended NBC training courses. Only 16 (34%) of them ever attended all of the above programs.

Sixty paramedic participants were enrolled to attend pre- and post-test. The associations between the contents of paramedic program and disaster medicine were determined by the consensus of three independent experts. As mentioned above, the paramedic training included mainly five parts, that is, core lecture, hospital practice, case conference, ambulance practice and specific training course such as DMAT training course in a 3-phase program. The training course of disaster medicine has been mainly conducted in core lecture, case conference and DMAT training course. The total hours spent in disaster medicine training were about 30 ± 3 hours that accounted for $8.4\pm2.2\%$ of lecture hours. It also accounted for $3.6\%\pm0.8\%$ of total practice time.

Comparison of pre- and post-test

The average pre-test score was 65 ± 10 points. The average score for those who attended disaster training in the last 12 months (n=47) was significantly better than those having no experience of training (72 ± 9 points vs. 48 ± 8 points, $P<0.001$). There is significantly better performance for these paramedics in posttest (65 ± 10 points vs. 82 ± 9 points, $P<0.05$) compared to pre-test. There was no definite difference between those attending disaster training in the last 12 months (n=47) and those not attending the training (n=13) in post-tests (84 ± 7 points vs. 80 ± 6 points, P=NS).

Discussion

This study demonstrated current condition of paramedic training in disaster medicine in Taiwan. The quantity and quality should be promoted progressively.

Formal training and certification is needed to

become an EMT or paramedic. In order to reregister, an individual must be working as an EMT or paramedic and meet a CME requirement. In Taiwan, training is offered at progressive levels: EMT-Basic, also known as EMT-I, EMT-Intermediate (or EMT-II), and EMT-3 (or Paramedic). EMT-I course typically emphasizes emergency skills, such as managing respiratory, trauma, and cardiac emergencies, and patient assessment. Formal courses are often combined with time in an emergency room or ambulance. The program also provides instruction and practice in dealing with bleeding, fractures, airway obstruction, cardiac arrest, and emergency childbirth. Students learn how to use and maintain common emergency equipment, such as backboards, suction devices, splints, oxygen delivery systems, and stretchers. Graduates of approved EMT basic training programs who pass a written and practical examination and earn the certificate. The course also is a prerequisite for EMT-II and paramedic training. EMT-II training requires training in heart rhythms, shock and trauma, wherein the caregiver learns to start intravenous fluids and give certain medications. Training commonly includes 50 hours of additional instruction beyond EMT-I coursework. The most advanced level of training is paramedic. At this level, the caregiver receives additional training in body function and learns more advanced skills. Because of the longer training requirement, almost all EMT-Paramedics are in paid positions, rather than being volunteers. Refresher courses and CME are available for EMTs and paramedics at all levels.

There are several common assumptions about disasters, compares them with research findings, and discusses the implications for planning. These assumptions are that:[15]

1. Dispatchers will hear of the disaster and send emergency response units to the scene.
2. Trained emergency personnel will carry out field search and rescue.
3. Trained emergency medical services personnel will carry out triage, provide first aid or stabilizing medical care, and if necessary decontaminate casualties before patient transport.
4. Casualties will be transported to hospitals by ambulance.
5. Casualties will be transported to hospitals appropriate for their needs and in such a manner that no hospitals receive a disproportionate number.
6. Authorities at the scene will ensure that area hospitals are promptly notified of the disaster and the numbers, types, and severities of casualties to be transported to them.
7. The most serious casualties will be the first to be transported to hospitals.

Most of these assumptions are based upon the interaction and cooperation of paramedics. During the phase of crisis management, paramedics become the leader of EMS for emergency management and rescue whereas they may become the role of public health investigators and workers during the phase of consequence management. Those involved in the development of prehospital care see this being brought about by coordination of the current resources and experience available, and developing training on internationally recognized courses to raise the overall standards of prehospital care. Ensuring a unified and coordinated approach to preparedness requires that benchmarks and standards be consistent across health care disciplines and public health, with

the most basic level being education of health professions students. Educational competencies establish the foundation that enables graduates to meet occupational competencies. However, educational needs for students differ from the needs of practitioners. In addition, there must be a clear connection between departments of public health and all other health care entities to ensure proper preparedness. These competencies are directly applicable to medical, dental, nursing, and public health students. They can also easily be adapted to other health care disciplines, so long as differences in levels of proficiency and the need for clinical competency are taken into consideration.

In conclusion, disaster medicine training has been implemented in paramedic training program and has also been proven to be useful in promoting their understanding of this field. However, it is also important to increase consistently the quality and quantity of the training.

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