

Effectiveness of the Standardization of Training and Uniform Certification on Disaster Medical Assistance Team in Taiwan

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Abstract

The objectives of this study were tried to evaluate the effectiveness of the standardization of training and uniform certification by making comparisons among Taiwan Society of Disaster Medicine (TSDM) and other Societies, to analyze the composition of the students joined in the examination of certification and to help further modification of DMAT set-up. We invited ten specialists of disaster medicine to establish an examination database for certification. Fifty questions were randomly selected as the final test of certification within the following four months. Totally 517 students joined in the examination of certification. Of 400 students attending the basic training course of TSDM, 10 students (2.5%) failed to pass, whereas 12 students (10%) failed ($P < 0.05$ vs. TSDM group) among another 117 students joined in the training course of other Societies. The mean scores were 74.67 and 69.15 in TSDM and other Societies respectively ($P < 0.05$). The effectiveness of the standardization of training and uniform certification has been proven in our study. Further policies may be needed to direct the standardization of training course, appropriate certifications and licensure of DMAT members and the engagement of emergency medical technicians in the DMATs. (*Ann Disaster Med.* 2003;1:70-77)

Key words: Standardization; Uniform Certification; Disaster Medicine

Introduction

The natural energy contains infinite lives, however, it sometimes brings calamity as well. In this high-density society, the centralization of population increases calamity level to thousand times than past. A scientific research reveals that the natural calamity is

growing by geometric progression in recent decades. In these few years, wars and terror attacks have been caused severe damages to human society. Hence, how to take precautions against natural and man make calamities has become a "Not a moment is to be lost" matter. Historically the government has

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relied on the military as a source of manpower and supplies during disasters.¹ Military personnel are well trained and prepared to establish and maintain essential services in areas that have had infrastructures destroyed by warfare. As a result of restructuring and downsizing, the military does not represent the labor pool that it once did. This results in a decrease in the military's ability to respond to disaster relief situations. The new role of the military during disasters will be to transport supplies, equipment, and volunteer disaster workers to, and within, a stricken area.¹ In Taiwan, so-called volunteer disaster workers has always conjured up images of the Tzu Chi Foundation aiding disaster victims. Its resources to act as providers of food, shelter, and emergency living areas, rather than providers of expert medical care. This void between Tzu Chi Foundation involvement and the traditional military role of providing disaster health care workers is currently filled by disaster medical assistance teams (DMATs). Staffed by volunteers, DMATs provide medical care both at the scene of a disaster and at transfer points and reception sites associated with patient evacuation.

According to the definition from National Disaster Medical Team (NDMS) in the United States,² DMATs are organized as a division of the federal government through the NDMS. NDMS is a joint effort of the

Department of Health and Human Services, the Department of Defense, the Department of Veterans Affairs, the Federal Emergency Management Agency (FEMA), state and local governments, and private organizations. NDMS was developed to provide for mutual aid among different parts of the nation in the event of a catastrophic disaster that overwhelms the health care resources in the locally affected area. Its main objectives are to (1) provide direct medical assistance to the disaster area in the form of DMATs, (2) evacuate patients who cannot be cared for locally, and (3) provide hospitalization through a nationwide network of pre-allocated hospital beds.

After Chi-Chi earthquake, our government has been engaged in the establishment of a good disaster response system including DMATs since July 2000.^{3,4} However, the compositions of our DMATs (either national or local) individualized, depending upon different policies and different guidance in each team, so the ability of emergency response and action are different in each team. The phenomenon elucidated that our disaster response system is still lacking in uniform policies and consistent planning. Taiwan Society of Disaster Medicine has been established in 2001, and engaged in the standardization of training and uniform certification of local disaster medical assistance team. The objectives of this study are tried to

1) evaluate the effectiveness of the standardization of training and uniform certification by making comparisons between Taiwan Society of Disaster Medicine and other Societies; 2) analyze the composition of the students joined in the examination of certification; and 3) help further modification of DMAT set-up.

Materials and Methods

We enrolled the specialists and experts of disaster medicine and designed the basic training course of local DMAT in January 2002. We conducted eight shows of basic training course in city and country of Taiwan during one year. Two hundred and twenty eight questions from ten specialists of disaster medicine were included in the examination database in August 2002. We picked up 50 questions as final and conducted five examinations of certification within four months. All of the persons attending in DMAT training courses were permitted to attend the examination of certification. Of them, 400 joined in the basic training course of Taiwan Society of Disaster Medicine, 117 of other Societies. The certification was based upon the scores above 60 points. The relationship between the training courses conducted from different societies and the performance and that among students with different medical background were also analyzed.

Statistic Analysis

All the data were processed and analyzed with Microsoft Excel 2000 for Windows. The techniques applied to data analysis included descriptive statistics generating and independent samples *t*-test and chi-square test. We compared the percentage of failure between the students from Taiwan Society of Disaster Medicine and those from other Societies by chi-square test. The differences in the performance of students were examined by an independent samples *t*-test. A *P* value less than 0.05 was considered as statistically significant.

Results

These 228 questions consisted of the categories such as NDMS, incident command system, public health, mass evacuation, logistics, and mass casualty. We picked up 50 questions for final examination. Of all 400 students attending the basic training course of Taiwan Society of Disaster Medicine, 390 students passed and 10 failed. Among another 117 students attending the training course of other Societies, 105 passed and 12 failed. The percentages of failure were 2.5% and 10% in Taiwan Society of Disaster Medicine and other Society, respectively ($P < 0.05$) (Table 1). The mean scores were 74.67 and 69.15 in Taiwan Society of Disaster Medicine and other Society respectively ($P < 0.05$) (Table 3).

Table 2 depicts the composition of the students attended in the training course of Taiwan Society of Disaster Medicine and joined in the examination of certification. The nurses, doctors, EMTs and volunteers comprised around 58.25% , 12.75% , 2.5% and 4.75% respectively. Table 2 depicts the composition of the students attended in the training course of other Societies and joined in examination of certification. The nurses, doctors,

EMTs and volunteers comprised around 29.06%, 9.4%, 3.42% and 52.14% respectively. The comparison between Table 2 revealed that the volunteers comprised around 4.75% in Taiwan Society of Disaster Medicine whereas they consisted 52.14% in other Societies. Few EMTs joined in the examination of certification in Taiwan Society of Disaster Medicine and other societies.

Table 1. The result of certification and chi-square test

	Pass (n=400)	Fail (n=117)	<i>P</i> value
TSDM	390 (97.5%)	105 (89.7%)	<i>P</i> <0.05
Other Societies	10 (2.5%)	12 (10.3%)	

Table 2. The composition of the students attended in the TSDM and other societies

Classification	TSDM		Other Societies	
	Sample (n=400)	Score (mean±S D)	Sample (n=117)	Score (Mean±S D)
Doctor	51 (12.75%)	74.07±8.2	11 (9.40%)	72.72±4.92
Nurse	233 (58.25%)	75.61±7.15	34 (29.06%)	71.71±5.07
Administrative staff	66 (16.50%)	72.03±7.4	6 (5.13%)	70±7.69
Lab technician	7 (1.75%)	79.43±3.6	0 (0.00%)	0
Radiologist	2 (0.50%)	73±1.41	1 (0.85%)	76
Pharmacist	12 (3.00%)	73.16±10.36	0 (0.00%)	0
EMT	10 (2.50%)	76±5.66	4 (3.42%)	70.5±7.72
Other	19(4.75%)	72.63±9.55	61 (52.14%)	66.79±8.74

Table 3. The mean score of TSDM and other societies

	TSDM (n=400)	Other Society (n=117)	<i>P</i> value (<i>t</i> -test)
Score (Mean±S D)	74.67±7.61	69.15±7.12	<i>P</i> <0.05

Discussion

DMATs deploy to disaster sites with sufficient supplies and equipment to sustain themselves for a period of 72 hours while providing medical care at a fixed or temporary medical care site.¹⁻² In mass casualty incidents, their responsibilities include triaging patients, providing austere medical care, and preparing patients for evacuation. In other types of situations, DMATs may provide primary health care and/or may serve to augment overloaded local health care staffs. Under the rare circumstance that disaster victims are evacuated to a different locale to receive definitive medical care, DMATs may be activated to support patient reception and disposition of patients to hospitals. DMATs are designed to be a rapid-response element to supplement local medical care until other contract resources can be mobilized, or the situation is resolved.

There are two national disaster medical assistance teams (NCKU·NTU) and 12 local disaster medical assistance teams in Taiwan at present. However, the compositions of our DMATs (either National or local) varied significantly, depending upon different policies and different guidance in each team, so the ability of emergency response and action are different in each team.⁵ The phenomenon elucidated that our disaster response system is still lacking in uniform policies and consistent planning.⁵ Taiwan Society of Disaster

Medicine has therefore been engaged in the standardization of training and uniform certification of local disaster medical assistance team. We found out that the scoring and success rate of the students attending the training courses of Taiwan Society of Disaster Medicine were both better than other students ($P<0.05$). Therefore, the training course needed to be standardized and DMAT members are required to maintain appropriate certifications and licensure within their disciplines.

As mentioned previously, a general DMAT teams normally consist of approximately 35 members - 4 or 5 physicians, 10 to 12 nurses and paramedics, 8 to 12 EMTs, with the remainder of the team made up of support personnel.¹ In Taiwan, however, EMT accounts for only 6.4% of DMAT members,⁵ which is different from the observations in the United States (28.7%).⁵⁻¹⁰ In our study, the EMT comprised only 2.5% of all the students attending examination of certification. It may also explain the fact that there is a greater need for physically strong persons with the ability of first aid rather than for highly trained medical specialists during a disaster. The immediate situation will require more tasks such as stretcher carrying than technical surgeries or procedures.¹ Besides primary first aid and emergency care, the paramedics and EMT always have accepted the training of "disaster medicine" and have some

clinical experiences, so the attendance of them should be a crucial step in setting up a good DMAT.⁵ In other words, more EMT should be encouraged to join DMAT.

Another issue is concerning about the role of the volunteers attending in the DMATs. There are still controversies about the role of volunteers. In one of our DMATs, there are more than 60% of the members to be volunteers.⁵ The volunteers attended in training course of other Society joined in the examination of certification comprised 52.14%. It is different from the DMATs in the United States (< 5%).⁹⁻¹² As we know, most of the volunteers lack in medical training such as basic and advanced life support and lack clinical experiences. The roles of the volunteers in real disaster situations may be limited. Instead, the paramedics on EMT should play a better role than the volunteers do.

An important limitation of this study is that the compositions of two groups were different; the students attending Taiwan Society of Disaster Medicine have higher percentage of medical education background than those in other societies. It may explain the better performance in certification from those in Taiwan Society of Disaster Medicine. Other limitations include limited students in other societies attending the certifications,

and lack of consistent certification in all national DMATs and local DMATs.

In conclusion, the effectiveness of the standardization of training and uniform certification has proven to be good. The uniform policies need to be direct to the standardization of training course, appropriate certifications and licensure of DMAT members and encourage the EMTs to attend the DMAT training.

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我國災難醫療救援隊統一認證及訓練標準化之成效

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摘要

本研究藉由比較參與中華民國醫學會災難課程訓練和其它學會災難課程訓練學員的成績，評估統一認證的成效；藉由參與統一認證成員組成，分析目前台灣地區災難醫療救援隊成員的組成；幫助災難醫療救援隊建置標準的建立。考題由十位災難醫學的專家學出題，合計共 228 題，挑出 50 題做為認證的試題。只要曾經參加災難醫療救援隊的訓練課程皆可參加認證考試。以 Microsoft Excel 2000 for Windows 做資料整理；以卡方檢定和獨立 t 檢定做資料分析。共有 517 人接受認證考試，其中參與中華民國災難醫學會舉辦的有 400 人，有 10 人不合格 (2.5%)；非學會舉辦的有 117 人，有 12 人合格(10%)(卡方檢定， $P<0.05$)。中華民國災難醫學會學員的平均成績為 74.67 分；非中華民國災難醫學會學員的平均成績為 69.15(獨立 t 檢定， $P<0.05$)。不管是參與中華民國災難醫學會舉辦的課程成員或是參與非中華民國災難醫學會舉辦的課程成員，其緊急醫療救護員的比例都相當低；而參與非中華民國災難醫學會舉辦的課程成員以其它人員(志工)占大多數(52.14%)。台灣地區的災難醫療救援隊的組成及訓練並無一定之標準。只有制定標準和統一的政策才能解決此問題。區域性災難醫療救援隊之教育訓練標準化及統一認證的成效是良好的。此政策必須朝向訓練課程標準化、災難醫療救援隊成員的資格和認證、鼓勵緊急醫療救護員加入災難醫療救援隊等方向來努力。(Ann Disaster Med. 2003;1:70-77)

關鍵詞：標準化；統一認證；災難醫學

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