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The Effectiveness of Simulation Based Medical Education In Teaching Concepts of Major Incident Response

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Abstract

We conduct a study to see the students confident and perceived understanding in the management of major incident response. We conducted a cross sectional questionnaire-base study on a group of 45 medical students who underwent their Emergency Medicine posting in UKMMC. They were given an hour lecture on major incident response and followed with a moulage exercise that consists of scene response, in-hospital management and a mock press conference. A 14 point questionnaire using a 5-point Likert scale was developed and used to gauge the perceived level of understanding and confidence among the respondents in the 7 principles areas of managing a major incident as outlined in the Major Incident Medical Management and Supports (MIMMS). The result was analyzed using a paired-T test to compare the mean score of pre- and post exercise. The results showed Simulation Based Medical Education (SBME) improved in the level of understanding in all the 7 areas of major incident response with the median score of 3/5 to 4/5 in pre and post-exercise respectively. The confident level also showed improvement from pre- to post-exercise in all areas except in communication (using the 2-way radio). Overall, there was statistically significant increase in term of understanding (t value = 5.596; p = 0.001) and confident level (t value = 5.259; p = 0.002) from pre- to post-moulage exercise. The students rated that their confidence and understanding of the principle of major incident management has improved considerably following the moulage session. Further studies are recommended by the authors on the value of using high fidelity SBME for Disaster Medicine education in undergraduates.

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1. Introduction

Major incident is a catastrophe that should be mitigated well and early in order to reduce the loss of life and its effect. According to Center for Research on Epidemiology of Disaster (CRED) disaster is define as situations or events that overwhelm local capacity, necessitating a request to national or international level for external assistance (Vos et al, 2009) . It has to meet at least one of these four criteria before it can be declared as a disaster which is 1) ≥ 10 people killed; 2) At least 100 people affected; 3) A call for international events; or 4) declaration of a state of emergency by the authority.

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Since the past century the incidents of disaster or major incident is ever increasing (Eshghi et al 2008). Even though health care providers play important roles during any major incident event unfortunately a lot of them were unprepared and the number trained to response is quite limited (Alexander et al 2005; Berman et al 2003, Greenberg 2002, Kaji 2003). Disaster Medicine is now an emerging branch of the medical sciences, focusing on the various aspects of health care in disaster situations from scene management, incident command systems, triage, treatment and transport, to emergency department and definitive care including public health measures and epidemiological methods. In 2008, healthcare response to disasters was described by Kirsch et al. (2008) as ever evolving and that the discipline of Disaster Medicine has migrated from a knowledge base of anecdotal “response reports” to scientific methodology. In addition to this there has been an emphasis on preparedness and mitigation strategies. Central to this is the development of several training methods. Most of these training courses were designed for experienced health care professionals for example Major Incident Medical Management and Support (MIMMS) (Hodgetts 2002), EmergoTrain System (ETS) and Hospital Preparedness (HoPe).

Most medical curricula do not incorporate principles of Disaster Medicine. Sinha et al (2008) described there was insufficient knowledge, attitude and practice medical undergraduates in India about disaster and disaster preparedness. Incorporation of education and training of Disaster Medicine in National University of Malaysia (*Universiti Kebangsaan Malaysia* - UKM) medical undergraduates was implemented under the new revised curriculum. It was part of the Emergency Medicine Module to the final year medical undergraduates. This paper presents the medical student opinions towards this new topic in term of understanding and their level of confidence in disaster medicine.

2. Method

A prospective cross sectional study was carried out among 45 fifth year medical undergraduates in Universiti Kebangsaan Malaysia Medical Center (UKMMC) undergoing emergency medicine posting. They were given a 90 minutes concept lecture on disaster risk management followed by 3 hours practical sessions on radio communication, field triage and transport of an injured victim.

Three hours disaster moulage was then designed depicting a major incident of explosion that occurred in a night club involving 15 victims. The conduct of the moulage was divided into four (4) phases which were 1) Scenario planning and setting up learning objective, 2) Scenario preparation including victim make-up and scene mock-up, 3) Scenario execution and 4) Debriefing.

In scenario planning, a group of lecturers discussed and decided on suitable scenario/ trigger to be carried out which in line with the course learning outcomes. A more detail learning outcomes pertaining to the disaster response were outline to the 7 principles of disaster response. Number of victims, scene selection, team divisions (rescuers, hospital team, and support staff) was identified. The roles of each team were also outlined.

In scenario preparation, three important elements were 1) Victims make-up, 2) Scene mock-up and 3) Students briefing. All these were done simultaneously by three different teams. In victims’ make-up, locally available materials were used to mock the injuries in each victims i.e. laceration, abrasion, hematoma, open and closed fracture, evisceration, burns, amputations etc. Mocking up the selected scene were carefully done using props and available resources. A short briefing on the roles of each students, safety aspects and precaution to be taken were stressed prior to execution.

During execution, the students played their role either as pre-hospital responders, hospital team, victims and support staff which include reporters, security, relatives, etc. The scenario starts with a call-in informing the pre-hospital team regarding a major incident. In this exercise, it was terrorist-related explosion of a night club involving 15 victims with various injuries. The pre-hospital team was then expected to response adhering to the principles of major incident response which include Command and Control, Safety, Communication, Assessment, Triage, Treatment and Transport.

Scene management was done and victims were transported to a field hospital using the techniques learned. In-hospital management was then delivered to the victims and scenes. These activities were assessed by a group of lecturers. Several video cameras were also used to capture salient teaching-learning issues according to the 7-principle areas. A mock press conference was held at the end of the exercise.

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