

Educational Benefit of the Advanced Disaster Medical Response Course in a Medical School Curriculum

Stephanie Goldberg, Michel Aboutanos, Lina Mata, Douglas Franzen, Rao Ivatury, Susan Briggs

ABSTRACT

Introduction and objectives: Despite the continual threat of both natural and man-engineered disasters, disaster response and emergency preparedness have not been formally adopted into medical student curricula. We hypothesized that the Advanced Disaster Medical Response (ADMR) course administered through the Panamerican Trauma Society would be an effective means of educating medical students in the basic tenants of disaster response.

Materials and methods: Fourth year medical students from VCU were enrolled in the ADMR course. The course is composed of didactic lectures and practical scenarios on triage and incident command medical students had no prior exposure to formal emergency preparedness curricula prior at VCU. Students were administered the same 30 question pre-test and post-test prior to and upon completion of the course respectively. Pre- and post-test scores were calculated and based on the number of correct answers. The change in test scores were compared using the paired t-test with $p < 0.05$ defined as significant.

Results: One hundred and fifty-nine students completed the ADMR course. Mean scores for the pre- and post-tests were 17.7 (59%) and 24.3 (81%) respectively. The post-test scores showed significantly improvement from the pre-test scores ($p < 0.0001$). Medical students demonstrated poor baseline knowledge of chemical agents followed by natural disasters in the pre-test compared with other areas of disaster management.

Conclusion: Formal disaster courses, such as ADMR, can serve as an effective method of educating medical students on disaster response. The introduction of the course in the school curricula along with objective clinical examination would be needed for long-term knowledge retention and application.

Keywords: Disaster courses, MCI, Medical student curriculum.

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RESUMEN

Introducción y objetivos: A pesar de las amenazas tanto de desastres naturales como de desastres provocados por el hombre, la respuesta a los desastres y la preparación para emergencias no han sido aplicadas formalmente al currículo del estudiante de medicina. Tenemos la hipótesis que el curso de respuesta médica avanzada a desastres (ADMR) administrado por la Sociedad Panamericana de Trauma sería una manera

efectiva de educar a los estudiantes de medicina en atención básica de respuesta a desastres.

Materiales y Métodos: Los estudiantes de 4to año de medicina de VCU fueron enlistados en el curso ADMR. El curso está compuesto de lecturas didácticas y escenarios prácticos de triaje y comando de incidentes, los estudiantes de medicina de VCU no habían sido expuestos anteriormente a un currículo formal de preparación para emergencias. A los estudiantes se les entregó las mismas 30 preguntas en el pre-test y pos test antes y al completar el curso respectivamente. Los resultados del pre y post test fueron calculados basados en el número de respuestas correctas. Las variaciones en los resultados de las pruebas fueron comparadas utilizando la Prueba T pareada con una $p < 0.05$ definida como significativa.

Resultados: Ciento cincuenta y nueve estudiantes completaron el curso ADMR. La media de los resultados para el pre y el post test fue 17.7 (59%) y 24.3 (81%) respectivamente. Los resultados del post test demostraron una mejora significativa de los pre test ($p < 0.0001$). Los estudiantes de medicina demostraron deficiencias en conocimientos básicos de agentes químicos seguidos por desastres naturales en el pre-test comparado con otras labores del manejo de desastres.

Conclusiones: Cursos formales de desastres, tales como el ADMR, pueden servir como un método eficaz para educar a los estudiantes de medicina en la respuesta a desastres. La introducción de la asignatura en los programas académicos, junto con el examen clínico objetivo sería necesaria para la retención y aplicación de los conocimientos a largo plazo.

Palabras claves: Respuesta medica avanzada a desastres.

INTRODUCTION

Natural and man-made disasters represent a continued threat to global communities. Despite the widespread belief that all disasters are unique, disasters more commonly result in similar medical and public health consequence. As a result, international emergency disaster response systems have been developed, and educational courses formally administered to prepare various medical and emergency responders in a consistent medical approach. This strategy, called the mass casualty incident (MCI) response, is widely accepted as the standard approach to decrease mortality associated with disasters.

Medical students represent the next generation of physicians who will be called upon to respond to a myriad of both natural and man-made disasters. Between 2001 and 2009, academic institutions participated in the community response to at least 106 instances related to the 11 Federal

Emergency Management Agency-declared disaster events that occurred.³ In some instances, medical students have participated in the emergency response even prior to completion of their medical education. In 2005, medical students without formal disaster training responded to a 7.6 Richter earthquake in Pakistan, Kashmir and Afghanistan, which resulted in the widespread demise of villages, roads, and considerable injuries. Due to the rugged nature of the landscape and the inability of senior medical professionals to withstand extreme condition, medical students provided care predominately independently and without formal supervision. The students subsequently called for formal disaster management training in both medical student and nursing curricula.¹ Similarly, in 2011, 66.7% of senior medical students at Virginia Commonwealth University in Richmond, VA, answered LCME survey stating that their training in disaster management was 'inadequate.' Yet, these responses were well above the national average when compared to other US medical schools.

In the spring of 2012, we sought to administer a formal disaster management training course to senior medical students and hypothesized that this would be an effective means to educate medical students in the disaster response.

MATERIALS AND METHODS

All senior medicals students at the VCU School of Medicine, in Richmond, Virginia, were enrolled in the Advanced Disaster Management Response (ADMR) course administered through the Panamerican Trauma Society in the spring of 2012. The course is composed of didactic lectures and practical scenarios on triage and incident command over a one-day period, modified specifically for the medical students. The course faculties were recruited from the VCU and local Richmond, VA, emergency response systems in the community with experience in field work and triage. Medical students had no prior exposure to formal emergency preparedness curricula prior at VCU. The course included a 1 hour informational session educating students about a career in emergency preparedness and disaster management. Students were administered the same 30 question pre-test and post-test prior to and upon completion of the course, respectively. Pre- and post-test scores were calculated and based on the number of correct answers. The change in test scores were compared using the paired t-test with $p < 0.05$ defined as significant. Students also underwent a triage workshop related to biologic, radiologic, chemical, explosive and natural disasters.

RESULTS

One hundred and fifty-nine students completed the ADMR course. Mean scores for the pre- and post-tests were 17.7 (59%) and 24.3 (81%) respectively. The post-test scores showed significantly improvement from the pre-test scores ($p < 0.0001$). Medical students demonstrated poor baseline knowledge of chemical agents followed by natural disasters in the pre-test test compared with other areas of disaster management.

DISCUSSION

Disaster management training has not been widely incorporated as an integral component of medical student education.² Yet, medical students represent a significant portion of health care providers available to respond to disasters (Kaiser 2009). Thus far, medical students have not been included as critical manpower in hospital disaster management plans. In a study of 523 US medical students, less than 20% believed they were adequately prepared to participate in national and radiographic disaster response (Kaiser 2009).

Many disaster management educational programs have been developed, but the curriculum has yet to be adapted specifically to the needs of medical students, nor have they been validated by scientific studies. In this study, we administered the ADMR course developed by the International Trauma & Disaster Institute and administered through the Panamerican Trauma Society specifically designed for medical students. The course included a triage portion with an emphasis on teaching the medical students how to appropriately allocate resources in an emergency setting. Students also participated in a voluntary informational session with a previously deployed disaster response physician to educate them on a career in disaster management.

Our study demonstrated a significant increase in knowledge of disaster management upon completion of the course. This is the first study to validate the effectiveness of the ADMR course in increasing knowledge on emergency preparedness and disaster management on the medical school levels.

We believe that a standardized medical student disaster program is an important component of medical school curricula and should be standardized. In an effort to develop a strong foundation in disaster management and emergency preparedness, we recommend that a validated course be adopted by all medical schools in the United States and administered during the first year of medical school. Students would, therefore, have a basic understanding of the principles of emergency management and triage, in the event a disaster

did occur. In addition, we propose that students undergo advanced training in the subsequent years in the areas of specific disasters—radiographic, biologic and nuclear disasters—coupled with the pathophysiology, diagnosis and management of associated injuries. Biyearly disaster drills in conjunction with the hospital are also an important component of this curricula. Lastly, we recommend the formation of a student led interest group specifically geared toward disaster management and emergency response in order to promote education and research. We are currently in the process of adopting this course as a consistent part of the VCU medical student curriculum, expanding the course to include nursing students, incorporating hospital wide simulation drills.

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ABOUT THE AUTHORS

Stephanie Goldberg (Corresponding Author)

Assistant Professor, Department of Surgery, Division of Virginia Commonwealth University, Virginia, USA, Phone: (804)827-1207 Fax: (804)827-0701, e-mail: sgoldberg@mcvh-vcu.edu

Michel Aboutanos

Professor and Chief, Division of Virginia Commonwealth University Virginia, USA

Lina Mata

International Fellow, Department of Surgery, Division of Virginia Commonwealth University, Virginia, USA

Douglas Franzen

Department of Emergency Medicine, Division of Virginia Commonwealth University, Virginia, USA

Rao Ivatury

Professor Emeritus, Department of Surgery, Division of Virginia Commonwealth University, Virginia, USA

Susan Briggs

Professor, Department of Surgery, Harvard Medical School, Harvard Medical International Trauma and Disaster Institute, Boston, USA