

Development and Implementation of a Disaster Medicine Certificate Series (DMCS) for Medical Students

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Abbreviations:

AAMC: Association of American Medical Colleges
CBRNE: chemical/biological/radiation/nuclear/explosive
CDC: Centers for Disease Control and Prevention
CDP: Center for Domestic Preparedness
CSRT: Children's Special Response Team
DMCS: Disaster Medicine Certificate Series
EM: Emergency Medicine
EMS: Emergency Medical Services
FEMA: Federal Emergency Management Agency
HAZMAT: hazardous material
HERT: Hospital Emergency Response Training
ICS: Incident Command System
LCME: Liaison Committee on Medical Education
MRC: Medical Reserve Corps
ULSOM: University of Louisville School of Medicine

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Abstract

Introduction: The recent increase in natural disasters and mass shootings highlights the need for medical providers to be prepared to provide care in extreme environments. However, while physicians of all specialties may respond in emergencies, disaster medicine training is minimal or absent from most medical school curricula in the United States. A voluntary Disaster Medicine Certificate Series (DMCS) was piloted to fill this gap in undergraduate medical education.

Report: Beginning in August of 2017, second- and third-year medical students voluntarily enrolled in DMCS. Students earned points toward the certificate through participation in activities and membership in community organizations in a flexible format that caters to variable schedules and interests. Topics covered included active shooter training, decontamination procedures, mass-casualty triage, Incident Command System (ICS) training, and more. At the conclusion of the pilot year, demographic information was collected and a survey was conducted to evaluate student opinions regarding the program.

Results: Sixty-eight second- and third-year medical students participated in the pilot year, with five multi-hour skills trainings and five didactic lectures made available to students. Forty-eight of those 68 enrolled in DMCS completed the retrospective survey. Student responses indicated that community partners serve as effective means for providing lectures (overall mean rating 4.50/5.0) and skills sessions (rating 4.58/5.0), and that the program created avenues for real-world disaster response in their local communities (rating 4.40/5.0).

Conclusions: The DMCS voluntary certificate series model served as an innovative method for providing disaster medicine education to medical students.

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Introduction

In recent years, the United States has witnessed an increased frequency of both natural and man-made disasters, including forest fires, hurricanes, transportation accidents, and mass-shooting events. In 2017, there were 16 natural disasters that topped US\$1 billion in damages each, and collectively caused thousands of fatalities, with over 4,000 deaths in Puerto Rico from hurricane Maria alone.^{1,2} The Federal Emergency Management Agency (FEMA; Washington, DC USA) defines a disaster as follows:

An event that results in large numbers of deaths and injuries; causes extensive damage or destruction of facilities that provide and sustain human needs; produces an overwhelming demand on state and local response resources and mechanisms; causes a severe long-term effect on general economic activity; and severely affects state, local, and private sector capabilities to begin and sustain response activities.

Because of this, medical providers and educators have been spurred to re-examine their own disaster response plans and bolster in-house capabilities and resources. One potentially under-utilized resource across teaching hospitals and local disaster relief systems is a disaster-trained physician work force. In order to create such a work force, disaster medicine training should begin at the medical school level; however, in many cases, medical students simply have no formal method for receiving disaster medicine training, nor for learning how they may integrate into local response systems. While hospital and Emergency Medical Services (EMS) personnel receive some degree of disaster preparedness training, such

training is minimal or absent across most medical schools.^{3,4} However, the expectation that every licensed physician has the training to assist in emergency situations remains a common public assumption. This is often not the case. There is very little currently in place to prepare physicians and medical students to be knowledgeable responders.

In 2003, a joint report by the Association of American Medical Colleges (AAMC; Washington, DC USA) and the Centers for Disease Control and Prevention (CDC; Atlanta, Georgia USA) addressed this issue.⁵ In this report, the AAMC and CDC recommended that bioterrorism and mass-casualty training be included in the medical school curriculum; however, this is not yet a requirement. As well, despite numerous attempts to create unified disaster medicine core competencies, there is no standardized disaster curriculum for health care professionals in the United States.⁶ Without competencies and Liaison Committee on Medical Education (LCME; Washington, DC USA) mandates, wedging optional disaster medicine education into an already demanding medical school curriculum is exceedingly difficult. Though medical graduates may receive some disaster medicine training during residency, this is very specialty-dependent, and the goal of a “disaster-prepared” or “disaster-aware” physician workforce will remain elusive.

Though not universal, several examples of medical school disaster medicine curricula exist, and specific examples are discussed below. Overall, these courses are typically developed within the medical school and rely heavily on university faculty to provide didactics, skills training, administrative oversight, and in many cases, secure funding. Additionally, these courses often favor on-campus drills and short courses over longitudinal community preparedness work. Course objectives are often set from a clinical perspective with emphasis on medical knowledge, and evaluation usually consists of pre- and post-test changes in knowledge. Like many other pre-clinical courses or clerkships, the learning agenda is set by the teaching institution with little flexibility for variation driven by student interests.

A different approach to disaster medicine education could address the current gaps in physician-trainee knowledge so that the goals of the AAMC and CDC, as well as expectations of the public, may be met. A shift from traditional, clinically-driven academic short courses to longitudinal, field-based participatory experiences may help students understand how their training contributes to community resilience, further motivating them to participate in disaster preparedness efforts early in their careers. By incorporating existing training programs and volunteer opportunities, medical schools can also decrease the teaching and cost burdens of incorporating a disaster medicine curriculum. A variety of courses designed for health care workers could theoretically be applied to medical students as well. Community entities such as the Medical Reserve Corps (MRC; US Department of Health and Human Services; Washington, DC USA) are actively seeking clinical and lay participants for regional response teams. Local health departments and hospitals may also offer training and volunteer opportunities for medical students.

To address the current gaps, existing community disaster relief organizations were used as a means for low-cost, high-quality interprofessional education to develop a Disaster Medicine Certificate Series (DMCS) for medical students. Here, the pilot year of a certificate series program is described, including an overview of participants, results of a retrospective student evaluation survey, and plans for future improvement.

Existing Medical School Disaster Medicine Education

Despite the difficulties of fighting for space in already crowded medical school curricula, some schools do mandate disaster training. The methods and duration in which this training is delivered, however, is variable. Examples of existing curricula include a didactic and exercise-based educational program,⁶⁻⁹ a two-week disaster medicine elective,¹⁰ a three-hour “Disaster 101 course” with a simulated chemical/biological/radiological/nuclear/explosives (CBRNE) event,¹¹ and a one-week “Disaster Leadership” course.¹²

Additionally, there are a variety of courses that are designed for health care workers in general that could theoretically be applied to medical students as well. Examples include training courses developed by the National Disaster Life Support (NDLS; Augusta, Georgia USA), including Basic and Advanced Disaster Life Support (BDLS and ADLS), and week-long courses provided by FEMA at their Center for Domestic Preparedness (CDP; Anniston, Alabama USA). While these courses contain material applicable for disaster preparedness, their focus is more towards disaster management, and thus may be less-applicable to the role of the medical student in a disaster situation.

Program Origin and Development

The idea for DMCS originated as a medical student capstone project out of the Global Health Distinction Track at the University of Louisville School of Medicine (ULSOM; Louisville, Kentucky USA). The distinction track requires students to pursue a longitudinal scholarly project related to global health, with the aim of eventual conference presentation or publication. With the understanding that many global health scenarios involve markedly reduced medical capabilities, a comparison between low-resource global health and disaster medicine was made. Prior to this, neither austere/low-resource medicine nor disaster medicine was present in the ULSOM curriculum. Recognizing this void in medical school undergraduate education, a ULSOM medical student, along with a faculty mentor, created a certificate series to fill this educational gap.

Report

Context

In August 2017, DMCS was launched as a voluntary certificate program that was open to second- and third-year medical students at the ULSOM. Created by a medical student and faculty member out of the Department of Global Health, DMCS is a program run by students for students. It was marketed as an extra-curricular opportunity to learn about varying aspects of disaster medicine, and as a means to get involved with real-world disaster relief efforts in the local community. Participating DMCS students are granted access to a centralized communications platform and are able to see upcoming events, receive important updates, and track their progress throughout the course of the series.

Curriculum

Completion of the certificate series is based on a point system. Over the course of two academic years, students earn points by participating in clinical skills training sessions, attending traditional didactic lectures, completing online modules, and joining local disaster relief organizations. Point-eligible activities are sponsored and taught by local and national community partners, in addition to university faculty physicians. Point values are stratified into four categories based on the general size and scale of activities, and are outlined in [Table 1](#).

Specialty	Point Value
Traditional Didactic Lectures, Online Modules	1
Examples: lectures occurring during student lunch hour, online modules provided by FEMA, and other primarily didactic lectures or talks approved by DMCS.	
Enrollment in Louisville Metro Medical Reserve Corps (MRC)	2
Skills Training Sessions	3
Examples: multi-hour events held on weekends, or hands-on skills trainings.	
Enrollment in Children’s Special Response Team (CSRT)	3
Completion of Hospital Emergency Response Training (HERT) for Mass-Casualty Events	5
Held at FEMA’s Center for Domestic Preparedness (CDP).	

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Table 1. DMCS Point Values by Event Type

Abbreviations: CDP, Center for Domestic Preparedness; CSRT, Children’s Special Response Team; DMCS, Disaster Medicine Certificate Series; FEMA, Federal Emergency Medical Agency; HERT, Hospital Emergency Response Training; MRC, Medical Reserve Corps.

Learning Activity	Community Partner	Educational Goal	Core Contents
Natural Disaster in the Ohio Valley	National Weather Service	To understand which natural disasters face the Ohio Valley and how each of them develop.	Thunderstorms, floods, tornadoes, winter weather.
Blast Injuries	Louisville EMS	To identify safety issues when dealing with explosive incidents.	Types of explosives, phases of explosions, EMS bomb squad operations.
		To discuss signs and symptoms of blast-related injuries and their treatment.	Pressure injuries, acceleration injuries, deceleration injuries, thermal injuries, and associated treatment.
Scope of Practice and Good Samaritan Laws	ULSOM	To discuss ethical issues in disaster response, and role of good Samaritan laws for medical students.	Good Samaritan laws in Kentucky, medical student protections in disaster response.
How to Make a Wilderness “Go-Bag”	University of Louisville – Emergency Medicine	To discuss essential medical supplies needed to create a sufficient expeditionary medical kit.	Hemorrhage control, airway, orthopedic injuries, wound management, analgesia, allergies, other general medications.
Wilderness Trauma Management	Wilderness Medical Society	To discuss various wound types and methods of hemorrhage control in a wilderness setting.	Venous bleeding, arterial bleeding, carotid injuries, subclavian injuries, aortic and femoral injuries, tourniquet application.

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Table 2. Didactic Lectures (Bolded = Completed)

Abbreviations: EMS, Emergency Medical Services; ULSOM, University of Louisville School of Medicine.

In order to complete the certificate course, students were required to:

- Acquire 15 points over two academic years;
- Formally enroll in the Louisville Metro MRC;
- Formally enroll in the National Wilderness Medical Society (Salt Lake City, Utah USA); and
- Complete FEMA Incident Command System (ICS)-100 and ICS-200 online modules.

After successful completion of required items and acquisition of the designated number of points, students receive a “Certificate in Disaster Medicine” signed by officials from the ULSOM and other community partners.

The DMCS topics were chosen based on a thorough review of existing literature on disaster medicine and emergency preparedness. Availability of community partners also acted as a driving influence on topics chosen for DMCS. For a list of completed

and scheduled events, along with corresponding community partners, see [Table 2](#) and [Table 3](#).

Program Evaluation

In order to evaluate student demographics, opinions of the pilot year, and potential student motivations for joining DMCS, a retrospective survey was conducted containing multiple-choice questions for demographic information and Likert Scales for student opinions. The surveys were completed anonymously by 48 of the 68 students participating in DMCS, and the university’s institutional review board (IRB) deemed evaluation of these surveys to be exempt from IRB review. The 48 submitted surveys for the 2017-2018 academic year were then analyzed. Survey response rates were high (70%).

Children’s Special Response Team

As an additional method for exposing students to real-world disaster preparedness and response and enhancing community

Learning Activity	Community Partner	Educational Goal	Core Contents
Active Shooter/ Stop the Bleed	University of Louisville – Trauma Department	To learn and practice basics of “Run, Hide, Fight” model for escaping active shooter situations.	Situational awareness, escape plans, role of law enforcement, barricade procedures, self-preservation.
		To learn and practice hemorrhage control.	Wound packing, tourniquet application, wound triage.
Mass-Casualty Triage Training	US Army	To learn and practice START triage system for mass-casualty events.	Patient triage, START vs SALT triage, patient transport, tourniquet application.
Incident Command System (ICS) Training	Louisville Metro Department of Public Health	To learn structure and organizational method required for dealing with mass-casualty incidents.	ICS roles and responsibilities, applications of ICS system.
		To practice construction of ICS hierarchy for specific scenario via tabletop exercise.	CBRNE event, flood, active shooter situation, train derailment.
In-Flight Emergency Training	Delta Airlines University of Louisville – Emergency Medicine	To learn etiologies and protocols for in-flight emergencies.	Most common in-flight emergencies, ground-based medical crews, role of provider, role of captain and crew, supplies available in emergency medical kits.
		To practice various emergency medical skills aboard an actual aircraft.	AED placement, intubation, cricothyroidotomy, epinephrine administration, splinting, oxygen tank assembly, naloxone administration.
HAZMAT / Decontamination Training	Norton Children’s Hospital	To introduce hospital decontamination procedures and available equipment.	Level C HAZMAT doff and don procedures, PAPR assembly, hospital protocols.
Hospital Emergency Response Training (HERT) for Mass-Casualty Incidents	FEMA	To learn and practice the establishment of an Emergency Response Team to mass-casualty incident.	ICS architecture, HAZMAT operations, patient triage, emergency medical skills, CBRNE education.
Medical Countermeasures and Shelter-Building	Louisville Metro Department of Public Health MRC	To learn and implement basics of mass vaccination, medical shelter building, and general public health response to local disasters.	Vaccine storage, medical tent construction, patient triage, medication administration.
Military Airway Management Training	US Army	To practice emergency airway management using pig tracheas.	Intubation, cricothyroidotomy.

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Table 3. Skills Sessions (Bolded = Successfully Completed)

Abbreviations: AED, automated external defibrillator; CBRNE, chemical/biological/radiation/nuclear/explosive; FEMA, Federal Emergency Medical Agency; HAZMAT, hazardous material; HERT, Hospital Emergency Response Training; ICS, Incident Command System; MRC, Medical Reserve Corps; PAPR, power air-purifying respirator; SALT, Sort/Assess/Life-saving intervention/Treatment and Transport; START, Simple Triage and Rapid Treatment.

resilience, the Children’s Special Response Team (CSRT) was developed in coordination with Norton Children’s Hospital Emergency Department (Louisville, Kentucky USA). The goal of the CSRT was to bolster hospital decontamination and disaster response capabilities by using trained medical students as deployable assets. Students were required to complete an additional FEMA module (IS-346) and attend a hospital-run training session on decontamination and hazardous material (HAZMAT)/personal protective equipment (PPE) procedures. After completion of the required training, students were placed on a phone registry as voluntary deployable assets registered to respond if called-on by Norton Children’s Hospital. Students would be capable of assisting hospital personnel in the decontamination of potential victims and provide additional help in other roles asked of them by Norton leadership.

Results

A total of 68 second- and third-year medical students participated in the pilot year, including 47 second-year and 21 third-year

students, constituting 29% and 14% of the student body, respectively. Over the course of one academic year, the mean number of points earned per student was 11 (SD = 7), with 19 students earning 15 or more points, 32 students earning five to 14 points, and eight students earning less than five points.

Five didactic lectures were presented as part of the program. Topics for didactic lectures included natural disasters, blast injuries, legal and ethical issues, making a wilderness “go-bag,” and wilderness trauma management. Individual educational goals, community partners, and core contents of these sessions can be found in [Table 2](#).

Five four-hour clinical skills training sessions were successfully performed, with two additional sessions planned for future programs. Topics for skills sessions included active shooter/stop the bleed, mass-casualty triage, ICS training, in-flight emergency training, HAZMAT/decontamination, medical countermeasures, wilderness medical skills training, and military airway management training. Additionally, several students participated in a one-week training course in Hospital Emergency Response Training (HERT)

Question (n = 47)	Rating (5 = Strongly Agree, 1 = Strongly Disagree)
Thus far, DMCS has delivered on promises given when I initially signed up.	4.65
Thus far, DMCS has provided high-quality instructors teaching hands-on skills.	4.58
Thus far, DMCS skills days have been high-quality and applicable to my medical education.	4.50
Thus far, DMCS lectures have been high-quality and applicable to my medical education.	4.46
Thus far, DMCS has given me avenues to participate in real-world disaster relief, preparedness, and response in my community.	4.40
Thus far, DMCS has provided high-quality lecturers during didactic teaching sessions.	4.38
After attending sessions put on by DMCS thus far, I feel more prepared to respond to local disasters in my community.	4.31
Disaster preparedness is important in Emergency Medicine (EM).	4.77
Disaster preparedness is important in medical specialties outside of EM.	4.52
Disaster preparedness is only important for those working in urban areas.	1.54
Disaster preparedness is only important for those working in hospitals.	1.54
When I am a doctor, I should be able to help plan for and lead in the event of a natural or man-made disaster.	4.67
When I am a doctor, people will look to me in the event of a natural or man-made disaster for help.	4.48
As a medical student, I feel I have a role to play in local disaster preparedness.	4.13
Disasters or medical crises depicted on media forms such as television, movies, or literature played a role in my decision to join DMCS.	3.44
A desire to enter a particular medical sub-specialty played a role in my decision to join DMCS.	3.21
Past experiences with disasters or local crises played a role in my decision to join DMCS.	2.85
Previous jobs played a role in my decision to join DMCS	2.79
Previous certifications played a role in my decision to join DMCS.	1.54

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Table 4. Medical Student Evaluations of DMCS

Abbreviations: EM, Emergency Medicine; DMCS, Disaster Medicine Certificate Series.

for Mass-Casualty Incidents at FEMA’s CDP. Individual educational goals, community partners, and core contents of these sessions can be found in [Table 3](#).

Exposure to real-world disaster response was also provided to students via participation in vaccine administration with the MRC and Department of Public Health and Wellness (Louisville, Kentucky USA) in response to a local Hepatitis A outbreak.

In addition, 48 retrospective student surveys were analyzed and one was excluded from further analysis because of undecipherable response data. The results are summarized in [Table 4](#) and [Table 5](#).

Discussion

This community-integrated DMCS is the first training program to utilize a voluntary certificate series model for medical student education in disaster medicine. At a time in which there is a clear need for disaster medicine education in medical schools, but no easy method for finding curriculum space to do so, this certificate series model can serve as a potential solution. Operating entirely outside required medical school coursework, DMCS serves as a means to provide both didactic and hands-on learning to a large number of students without impeding on the existing curriculum. This “extra-curricular” approach to learning topics and skills not otherwise available makes DMCS attractive to medical students, as evidenced by the large number of students voluntarily enrolled in the pilot year. These numbers are expected to increase as enrollment is made available to the next incoming second-year class.

The ability to bypass the required curriculum and the high student interest are not the only qualities that make DMCS unique. While many other medical schools rely almost entirely on university Emergency Medicine (EM) faculty to conduct most of their

Specialty	Percentage	n
Anesthesia	4	2
Emergency Medicine	23	11
Family Medicine/ Internal Medicine	11	5
Med/Peds	4	2
OBGYN	4	2
Pathology	2	1
Pediatrics	19	9
Psychiatry	4	2
Surgery	26	12
Unknown	2	1

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Table 5. Desired Future Specialty Demographics of Students in DMCS

Abbreviations: DMCS, Disaster Medicine Certificate Series; OBGYN, Obstetrics and Gynecology.

training, DMCS focuses on engaging disaster preparedness and relief organizations in the community to fill this role. By forming relationships with community partners, DMCS ensures that students are not only aware of what resources exist in their local community, but also are trained by the very people that students would be working with if they were ever called upon to respond. This addresses a current topic in disaster medicine: inter-agency cooperation in disaster preparedness so that disparate agencies that come-together in the response phase do not operate in silos because

of a lack of familiarity, but rather train together. Furthermore, by requiring participation in the MRC and providing an opportunity to join the CSRT, DMCS gives students the ability to respond to a disaster in their area. This focus on community engagement and real-world response opportunities legitimizes disaster medicine training, and thus makes it an appealing option for medical students.

An additional unique aspect of the certificate series approach is the ability for students to choose their own path. While there are core requirements, the point system allows for students to pick and choose specific areas of interest within disaster medicine to explore more deeply. Whether a student is interested in austere medicine, community preparedness, or bioterrorism, the DMCS model is fluid enough to give students control over their own education, while ensuring they still receive a basic overview of most topics in disaster medicine.

Diving further into medical student motivations for learning disaster medicine, the survey results showed that of all factors listed, disasters depicted in media forms such as television, movies, or literature played the greatest role in student's decision to join DMCS. The survey did not further delineate which forms of media influenced students to a greater degree; however, this finding supports the premise that medical students see disaster preparedness and response as something they may participate in during their medical career.

Interestingly, it was anticipated that students joining DMCS would be primarily interested in pursuing careers in EM. However, survey results showed that only 23% of students that responded to the survey were interested in EM as a future career. A wide-array of specialties were represented by the survey results (Table 5), showing that students see disaster preparedness and response as important for all doctors, not just EM.

Limitations

Limitations

The fact that there are no LCME guidelines or "gold standard" competencies for disaster medicine makes it very difficult to ensure that the training will be deemed comprehensive at other institutions. Furthermore, without longitudinal studies, it is unable to be proven that students are retaining the information they learned in DMCS, or whether DMCS benefitted students in furthering their careers. Lastly, as DMCS grows, the increased resources required to maintain the program raises the potential for burnout amongst community partners, which may become strained beyond capacity as the program expands.

Next Steps

As the program matures, it is hoped that DMCS will evolve from a general assortment of skills sessions and lectures into a more focused, goal-oriented training curriculum. Future programs will include a set of required core modules centered around active shooter/stop the bleed, CBRNE, emergency medical skills, ICS training, psychological first aid, and mass-casualty triage. Each of these core modules will build upon each other over the course of one year to culminate in a large-scale, multidisciplinary, mass-casualty simulation involving DMCS students, police, fire, and EMS.

Conclusion

All physicians should know how to safely and effectively respond to a disaster, but few ever receive formal training. The DMCS model can help provide that training and give future physicians the opportunity to respond to real-world events. At a time in which there is a need for disaster medicine education in medical schools, but no easy method for finding curriculum space to do so, the DMCS model can serve as a potential solution.

References

1. NOAA National Centers for Environmental Information. Billion-dollar weather and climate disasters: overview. NOAA Web site. <https://www.ncdc.noaa.gov/billions/>. Accessed August 21, 2018.
2. Kishore N, Marques D, Mahmud A, et al. Mortality in Puerto Rico after Hurricane Maria. *N Engl J Med*. 2018;379(2):162–170.
3. Smith J, Levy MJ, Hsu EB, Lee Levy J. Disaster curricula in medical education: pilot survey. *Prehosp Disaster Med*. 2012;27(5):492–494.
4. Jasper E, Berg K, Reid M, et al. Disaster preparedness: what training do our interns receive during medical school? *Am J Med Qual*. 2013;28(5):407–413.
5. Association of American Medical Colleges (AAMC). *Training Future Physicians about Weapons of Mass Destruction: Report of the Expert Panel on Bioterrorism Education for Medical Students*. Washington, DC, USA: AAMC; 2003. <https://members.aamc.org/eweb/upload/Training%20Future%20Physicians%20About%20Weapons.pdf>. Accessed August 21, 2018.
6. Jasper EH, Wanner GK, Berg D, Berg K. Implementing a disaster preparedness curriculum for medical students. *South Med J*. 2017;110(8):523–527.
7. Wiesner L, Kappler S, Shuster A, DeLuca M, Ott J, Glasser E. Disaster training in 24 hours: evaluation of a novel medical student curriculum in disaster medicine. *J Emerg Med*. 2018;54(3):348–353.
8. Pollard KA, Bachmann DJ, Greer M, Way DP, Kman NE. Development of a disaster preparedness curriculum for medical students: a pilot study of incorporating local events into training opportunities. *Am J Disaster Med*. 2015;10(1):51–59.
9. Patel VM, Dahl-Grove D. Disaster preparedness medical school elective: bridging the gap between volunteer eagerness and readiness. *Pediatric Emerg Care*. 2016;34(7):492–496.
10. Kaji AH, Coates W, Fung CC. A disaster medicine curriculum for medical students. *Teach Learn Med*. 2010;22(2):116–122.
11. Scott LA. Disaster 101: a novel approach to health care students' disaster medicine and emergency preparedness training. *Disaster Med Public Health Prep*. 2009;3(3):139–140.
12. Parrish AR, Oliver S, Jenkins D, Ruscio B, Green JB, Colenda C. A short medical school course on responding to bioterrorism and other disasters. *Acad Med*. 2005;80(9):820–823.