

the results of the study through the lens of their own backgrounds and operational contexts.

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Putting the Theoretical to Practical Use

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Introduction: Managing an MCI (Mass Casualty Incident) can be a daunting task for emergency responders. Effective management can be a matter of life and death but can be directly impacted by the feelings of the incident commander.

Aim: Students were trained to be incident commanders, then following the course were given a survey. In the days following the training, an MCI occurred involving a train full of passengers. The students were then given another survey to assess their readiness following the practical use of their studies.

Methods: Students were given a survey to determine their mean level of confidence in managing MCIs prior to training, and following the training. Following the training, there was an increase in confidence. After the training, there was an MCI in which their theoretical knowledge was put to the test.

Results: The pre-training self-efficacy mean scores of younger students ($M=3.5$, $SD+0.23$) increased after the training ($M=3.8$, $SD+0.28$) and rose even more following the presentation of the Turin train accident ($M=4$, $SD+0.26$). While a similar increase in self-efficacy was found among the more mature students post-training compared to the level prior to the training ($M=3.7$, $SD+0.44$ versus $M=3.4$, $SD+0.56$), the mean self-efficacy score of the mature students decreased following the presentation of the Turin train accident to the pre-training level ($M=3.4$, $SD+0.51$).

Discussion: Mean scores of self-efficacy and confidence in managing MCIs were found to be higher among medical students that were previously trained in coping with MCIs compared to medical students who participated in such a training program for the first time.

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A Qualitative Study of Household Emergency Preparedness of the Elderly and the Medically Frail Living in Coastal Urban Environments

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Introduction: As more chronically ill people are living in the community and disasters are occurring frequently, the elderly and the medically frail vulnerable populations are experiencing significantly more disaster-related morbidity and mortality than the rest of the population. A failure to adequately address these vulnerabilities has been shown to have negative effects on the response to the disaster and the community as a whole.

Aim: The purpose of this research was to understand how older and/or medically frail adults have experienced disaster and how

this experience impacts what they do now to prepare for disaster. A second purpose was the generation of theory regarding the process through which community members prepare for disasters.

Methods: This study employed a qualitative descriptive methodology, Situational Analysis, to explore the social processes of disaster preparedness in older and/or medically frail adults.

Results: The core category was “Experience is the Best Teacher.” Based on the findings, it was theorized that these community members are generally considered unprepared for disaster. Their lack of preparedness is due in large part to a lack of education on how best to prepare. Once educated, motivation for self-responsibility of household emergency preparedness can be expected. Community interventions like distributing disaster supply kits and offering evacuation assistance help overcome their situational impediments to preparedness and provide the best chance for these community members to survive disasters without becoming ill or injured or experiencing a decline in their baseline functional status. If these community members are incidentally prepared, it is largely due to their past experience with disaster or their professional experience.

Discussion: The results from this study could inform emergency plans and policy efforts to better meet the needs of elderly and medically frail community members during disaster.

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A Quantitative Study of the Dimensional Change of Inferior Vena Cava on Computed Tomography During Acute Hemorrhage Shock

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Introduction: The collapsed inferior vena cava (IVC) in computed tomography (CT) images can be found in patients with hypovolemic shock, making it an attractive diagnostic sign in early treatment of trauma patients. However, current research results are controversial.

Aim: To examine the dimensional change of IVC during acute hemorrhage through a volume controlled acute hemorrhagic shock model in swine.

Methods: Volume controlled hemorrhage was performed in 10 adult Bama minipigs. Enhanced CT scan and hemodynamic monitoring were performed when the cumulative blood loss volume reached 0%, 10%, 20%, 30%, and 40%. The transverse diameter (T) and anteroposterior diameter (AP) of IVC were measured in axial images. Hemodynamic parameters were obtained with a Pulse Contour Cardiac Output (PiCCO) hemodynamic monitor device. Arterial blood samples were also collected for artery blood gas analysis at each time point.

Results: As the blood loss volume increased, the collapsibility (T/AP) and cross section area (CSA) of IVC significantly changed in hepatic level and pre-renal level. The significant decrease of the CSA of IVC (shrink) occurred early when the blood loss volume reached only 10%.

Discussion: The IVC shrank early but collapsed late during acute hemorrhages in swine. The collapsed IVC on CT scans

suggested a severe hypovolemic shock state but not an early indicator for shock.

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Radiation: Preparing for the Glow That You Can't See

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Introduction: In 2013, a multinational collaboration met to improve the global and nation-specific preparedness and response in managing casualties from nuclear and radiological disasters. From this meeting, a survey was developed and distributed in both Japanese and English. The results published four years later illustrate a lack of understanding about radiation and risks to the health care provider.

Aim: To dispel myths and increase understanding regarding trauma treatment and healthcare risks for healthcare providers during a radiologic event.

Methods: IRB approved survey and literature review

Results: A total of 418 surveys were analyzed. Although 44% of participants acknowledged that they had taken at least one radiological training course, the majority of the respondents were still not comfortable with radiological emergencies.

Discussion: Despite the plethora of both online and in-person radiological training availability, healthcare providers are not comfortable with the topic. Based on information from the survey, it is important to dispel myths and educate healthcare providers so that they have reasonable expectations regarding risks and to ensure that they are comfortable coming to work. By doing this, there will be an adequate healthcare presence to help take care of patients who are not only in need of immediate trauma and radiologic exposure care but also with non-affected patients coming for emergent and scheduled health care needs.

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Real-Time GIS for Health Disaster Response in the Largest Archipelagic Country

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Introduction: Besides being located on the Pacific Ring of Fire, Indonesia is the largest archipelago country in the world. Some parts of the country are not very accessible. It raises difficulties in controlling and monitoring a disaster response mission remotely in real-time. Muhammadiyah, the Indonesian non-governmental organization (NGO) that has been responding to disaster since 1919, used Geographic Information Systems (GIS) for Health Disaster Response (HDR) in the Lombok Earthquake 2018, in cooperation with ESRI Indonesia, as one alternative to disaster response controlling and monitoring.

Aim: To show the benefit of using real-time GIS for HDR in an archipelago country.

Methods: While responding to the disaster in Lombok, the Muhammadiyah Health Disaster Response Team was collecting data of patient, medication, problem, need, location, and resource with computers and smartphones, inputting the data that was forwarded to the ArcGIS platform. The Health Disaster Response Team coordinator and Muhammadiyah Board monitored and analyzed the health response through the GIS dashboard in Yogyakarta, 652km far from Lombok Island.

Results: Using real-time GIS has been useful for disaster response. It was efficient by cutting flight and other transport costs, connected by the internet, and communicative by graphic and map dashboard. It was a green approach since it was paperless, and analysis-friendly by real-time data compilation and computation.

Discussion: One of the big gaps in disaster response monitoring seems to be real-time data. Especially in an archipelago country, it is costly, time-consuming, and resource consuming. Daily big data may be frustrating and can become “white paper syndrome.” One of the good approaches to that is GIS Web services although it must be realized that the internet connection in a rural area can be another challenge. It can be solved by in-gadget data memory that can be delivered while the internet connection is available.

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Regional Engagement Program: Supporting Local Leadership and Building Local Skills and Knowledge in Order to Develop a Systematic Approach to Disaster Medical Management

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Introduction: One of the key components in any effective disaster response is the capacity of local communities to respond in a timely and efficient manner. Over the last 3 years, the National Critical Care and Trauma Response Centre in Darwin has been involved in building regional capacity across the Asia-Pacific, supporting local leadership and building local skills and knowledge in order to develop a systematic approach to disaster medical management.

Aim: This presentation is to describe the Regional Engagement Program, its strengths, weaknesses, and outcomes.

Methods: We will describe the background to the program, the process for regional engagement and the Results of our evaluation. The program used the Major Incident Medical Management Systems (MIMMS) approach which was delivered in-country and included identifying and using local personnel to deliver the program. The program was conducted across the region in Myanmar, Fiji, Tonga, Vanuatu, Samoa, Timor, and Indonesia. Initially the courses were run by personnel from Australia but through engagement with local Ministries of Health and collaboration with identified key