Disasters & Diseases: An Online Role-Playing Platform for Mass Casualty Incident Simulation and Education

Efrat Kean MD, MSc[1], *Deena Wasserman MD*[2], *Ari Schwell MD*[3]
1. Thomas Jefferson University Hospital, United States
2. Assuta Hospital Ashdod, Israel
3. Temple University Hospital, United States

Introduction: The COVID-19 pandemic caused residency programs to rapidly transition to using virtual learning for didactic education. A tabletop game-style simulation of a mass casualty incident (MCI) was planned for the summer of 2020; rather than cancel it, the authors developed a method to run the simulation utilizing an online gaming platform (Roll20) to create an MCI drill. This model of virtual, game-style simulation has implications for education across all levels of training, making large-scale MCI simulations available to groups that otherwise would not have the opportunity or resources to participate in person.
Methods: This study utilized a cross-sectional survey of fifteen emergency medicine residents who participated in a virtual MCI simulation. The survey assessed learners' perceptions of the simulation, focusing on preparedness, knowledge gained, impact on clinical practice, and utility and quality of the virtual tool. Survey items included Likert-scale and open-ended questions.
Results: Seven individuals responded to the survey. 85.7% of respondents felt more prepared to deal with an MCI after the exercise and reported that this exercise was practice-changing. 85.7% reported that the virtual platform was a useful educational tool in disaster management and would be useful for other topics. Most participants (57.2%) felt that the pre-exercise instructions were challenging to understand, but 71.5% felt that, nonetheless, the learning objectives were achieved. Open-ended comments included a sense that this teaching method was "fun, innovative, and engaging," but required more detailed pre-learning to ensure that all individuals could navigate the platform well.
Conclusion: An online role-playing platform is an effective, engaging method of conducting MCI exercises that improves knowledge and changes practice. Remote learning methods have the potential to increase participation in MCI simulations. This study is limited by the small group that participated. A larger study with wider participation is a promising future avenue for research.

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Use of VR Video on Disaster Medicine in Pre-Graduate Education of Medical Students

Shunji Kasaoka MD, Hisaki Naito
Kumamoto University Hospital, Japan

Introduction: In Japan, where natural disasters are frequent, disaster medical education is becoming increasingly important in pre-graduate medical school education, but it is difficult to conduct medical training and practice at actual disaster sites. In cooperation with a private company, we have created a VR video that simulates medical care at a disaster site and utilized it for clinical training of medical students. We report on the usefulness of the VR-based education together with a student survey.
Methods: The VR video was created based on a scenario in which many people were injured when a train derailed and overturned due to a major earthquake, and a rescue team was dispatched from the university hospital. The video enables the viewer to learn about the activities of the medical team from the perspective of a doctor and to learn about on-site safety management by reproducing the disaster scene in computer graphics. In the clinical training of medical students, lectures were given using the VR video, and practical training for patient examination was conducted using a simulator.
Results: In a student survey, many responded that the VR video was useful for learning about medical treatment at disaster sites.
Conclusion: In Japan, where natural disasters occur frequently, the use of VR video in pre-graduate education for disaster medicine is considered useful.

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From Classroom to Crisis: Transforming Medical Training with Game Based Learning

Aidana Sissenberdiyeva MD
Kazakh National Medical University named after S.D. Asfendiyarov, Kazakhstan

Introduction: Preparing medical students for disaster response is a complex challenge that goes beyond theoretical knowledge. To address this, an innovative educational tool in the form of an interactive board game has been created. The game is designed to simulate real-life emergency scenarios, engaging students in critical thinking, teamwork, and effective decision-making under pressure.
Methods: The board game utilizes open-source guidelines to simulate realistic emergency scenarios, requiring strategic decision-making. Players assume roles such as Team Leader, Doctor, Medical Support, Logistics Coordinator, and Psychologist, each contributing unique skills. Game mechanics include triage, resource management, and resolving ethical dilemmas, such as prioritizing care with limited supplies or addressing psychological distress. Scenarios progress through timed rounds, emphasizing urgency and collaboration.
Results: The board game was evaluated internally for educational content and design feasibility. The scenarios integrate real-world medical protocols, emphasizing decision-making under pressure. The game's theoretical framework was validated against established emergency medicine practices, highlighting its potential to foster engagement and collaborative learning among medical students. The evaluation focused solely on aligning the game content with open-source medical standards and ensuring an accurate representation of crisis conditions.
Conclusion: This game introduces a fresh approach to training healthcare students in disaster response. Combining realistic scenarios with a strategic, team-based format creates a stimulating and effective learning environment. The game shows

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potential as a valuable tool for medical education, providing a risk-free environment for developing critical skills in disaster response and preparing students to handle real-world crises confidently and competently.

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Building Operational Readiness–Educational Insights from Exercise Kingfisher for Mass Casualty Incidents

Dr Anissa Lye MBBS, MMed, Dr David Teng MBBS, MMed, FAMS
Tan Tock Seng Hospital, Singapore

Summary: Exercise Kingfisher, conducted in Singapore's Tan Tock Seng Hospital (TTSH) on September 21, 2024, simulated a hospital-wide response to a mass casualty event involving hazardous materials (HAZMAT) and radiation threats. The exercise aimed to validate the Emergency Department's (ED) Civil Emergency Plan and assess operational readiness.

A multi-disciplinary team of physicians, nurses, and operations staff participated, ensuring a cohesive response.

Disaster education was integral to the success of Exercise Kingfisher. Over 1,400 hospital staff underwent comprehensive training, including the use of HAZMAT personal protective equipment (PPE), decontamination procedures, field medical team training, and critical care response. Regular email reminders and WhatsApp group updates kept staff informed about evolving workflows, ensuring real-time communication and readiness. Evidence based practices, including decontamination wash timings and care for the pediatric casualty, were integrated. To improve overall situational awareness and provide real-time casualty numbers, we leveraged technology. Virtual reality (VR) was employed for training decontamination staff, which optimized the training of a large number of staff within a short period. Technology integration improved patient tracking, resource allocation, and inter departmental coordination.

Exercise Kingfisher validated the effectiveness of staff training and protocol updates. The hospital managed 204 casualties in four hours, demonstrating a high level of operational readiness. VR technology enabled more staff to be trained, and real-time communication tools improved coordination. The multi-disciplinary approach expedited triage and treatment, reducing response times and increasing patient management efficiency.

Exercise Kingfisher has highlighted the importance of disaster education and protocol revision in preparations for a mass casualty incident. By integrating updated evidence, enhancing staff training, and employing a multi disciplinary approach, TTSH Emergency Department demonstrated a readiness to manage HAZMAT and radiological threats. Future exercises will continue to build on these successes, focusing on refining educational programs and strengthening interdepartmental collaboration.

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From Theory to Practice: The Impact of In-Situ Full Scale Drills on Mass Casualty Incidence Preparedness among Emergency Medical Technicians and Emergency Department Staff in a Peripheral Hospital in Lebanon.

Aed Saab MD[1,2], Roxanna Lefort MD[2], Ryan Hata MD[2]
1. American University of Beirut Medical Center, Lebanon
2. Indiana University SOM, United States

Introduction: The effective management of mass casualty incidents (MCIs) is essential for all emergency medical services (EMS) and emergency department staff, though training at peripheral or satellite hospitals is often insufficient. Globally, these hospitals often receive an influx of patients from MCIs, but do not have the resources available in the larger hospitals. This study used an in-situ drill and retrospective pre-post drill surveys to assess the impact of this type of drill on improving preparedness to handle MCIs in a peripheral Emergency Department in Lebanon.
Methods: An in-situ full-scale drill was conducted in which EMS personnel triaged patients on-site and made transport decisions to a participating peripheral hospital. Hospital staff received the patients, triaged, and initiated proposed management. Retrospective pre-post surveys were distributed to 55 participants for self-assessment of knowledge and comfort with multiple competencies related to preparedness.
Results: 34 surveys were filled out. Preliminary results indicate the drill significantly enhanced participants' preparedness, with notable improvements in all areas. Statistical analysis of the data using a combination of statistical techniques is currently underway to confirm these findings. This will provide a comprehensive understanding of how effective the disaster drill was in improving preparedness and whether certain factors influence the outcomes.
Conclusion: The findings underscore the critical role of in-situ full-scale drills in enhancing the preparedness of EMS and hospital staff for mass casualty scenarios, specifically in peripheral hospitals. Continuous training and the implementation of realistic simulations are recommended to address remaining gaps and ensure comprehensive readiness for future MCIs as these hospitals are likely to receive patients from an MCI. This study highlights the importance of including both EMS and peripheral hospitals in MCI preparedness and further development of MCI training programs focused in these settings.

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Approaches to Reduce Anxiety About Radiation Exposure Among Medical Personnel Who Deal with Radioactive Contaminated Patients

Takakiyo Tsujiguchi PhD, Masaru Yamaguchi PhD, Kanako Yamanouchi PhD, Ryusei Maekawa BS, Masato Naraoka MD, PhD, Katsuhiro Ito MD, PhD
Hirosaki University, Japan

Introduction: When dealing with radioactively contaminated patients, medical staff often experience anxiety, even though their health is unlikely to be affected by radiation exposure. An application has been developed to simulate the exposure

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