

**Introduction:** A Mass Casualty Incident response (MCI) full scale exercise (FSEx) assures MCI first responder competencies. Simulation and serious gaming platforms (Simulation) have been considered to achieve and maintain first responder competencies with the challenge of the FSEx. The translational science (TS) T0 question: How can students achieve similar MCI competencies through the use of simulation MCI exercises as with a FSEx?

**Method:** Initial TS phase T1: Scoping Review

A Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Review was conducted to develop statements for the TS second phase T2 modified Delphi study. 1320 reference titles and abstracts were reviewed with 215 full articles progressing for full review leading to 97 undergoing data extraction.

Second TS stage T2: modified Delphi study

The database was analyzed and initial draft statements were created. Selected modified Delphi experts were presented with 27 statements with instructions to rank each statement on a seven-point linear numeric scale, where 1 = disagree and 7 = agree. Consensus amongst experts was defined as a standard deviation  $\leq 1.0$ .

**Results:** After three modified Delphi rounds 19 statements attained consensus and eight did not attain a consensus.

**Conclusion:** The modified Delphi experts agreed that the simultaneous integration of individual duty and incident management skills should be incorporated into simulation MCI exercise design to achieve competencies depending on high physical fidelity to develop the individual's manual abilities, as well as high conceptual fidelity, to develop the individual's clinical reasoning and problem-solving skills. MCI simulation exercises can be developed to achieve similar competencies as FSExs incorporating the 19 statements that attained consensus through the TS phases of a scoping review (T1) and modified Delphi study (T2). The TS process should continue with development of these exercises in the T3 implementation stage and then evaluated in the T4 stage.

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### Evaluation of the Degree of Crisis Awareness and Behavioral Change Through Disaster Exercise: A Case Study of a Disaster Response Exercise in a Pharmacy Department

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**Introduction:** The authors developed an evaluation tool to measure changes in exercise participants' awareness of disaster risk and their disaster preparedness behaviors. To create the tool, a mechanism was modeled to visualize the process of changing people's crisis awareness and behavior and questions

were developed for each of the twelve factors and two outcomes within the mechanism. In this study, we conducted a disaster exercise in the pharmacy department of Hospital A, one of the disaster base hospitals, and measured the effectiveness of the exercise using the tool.

**Method:** In the disaster exercise, participants were asked to perform dispensing tasks on five dummy prescriptions using actual medicines, based on the assumption that the dispensing support system was out of order due to a major earthquake. Participants were paired up and dispensed as much as possible within a time limit of 30 minutes. Pre- and post-education sessions were conducted before and after the exercise. Respondents were asked to score each question on a 5-point scale at three time points: before the pre-education, immediately after the disaster exercise, and after post-education.

**Results:** 59 people, including 16 participants, responded to the questionnaire using the evaluation tool. The analysis of the evaluation results revealed that the disaster exercise increased the participants' crisis awareness. Furthermore, participants improved their scores on the questions on feelings of anxiety about the current situation, assumptions about the impact, sense of ownership, and fear of not acting, but no change was observed among non-participants. However, there was no significant difference in scores between the two groups regarding whether they had taken action for disaster preparedness in the period following the exercise.

**Conclusion:** The exercise raised the participants' crisis awareness, but did not encourage them to change their behavior. Future research should consider ways to encourage staff members to take action to prepare for disasters.

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### Teaching Senior Medical Students Mass Casualty Incident Management by 3D Tabletop Exercise without Lecture: Increase Students' Knowledge and Motivation

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**Introduction:** Mass casualty incident (MCI) management was usually taught by lectures and then tested by exercises. However, the lecture may not be interesting and tabletop exercise (TTx) may not adequately engage participants, especially senior medical students. To solve these two problems, we think that a TTx using 3D models can be a good teaching method of MCI management for medical students.

**Method:** A TTx of MCI in the emergency room (ER) was designed for senior medical students based on five core capabilities of MCI management: incident management system, event recognition and initiation of response, patient triage, surge capacity and capability, and recovery and demobilization. 3D models containing miniatures of the ER, hospital staff, patients, and other personnel were used in the TTx. No lecture was conducted before or during the exercise. Students needed to discuss how to respond to events in the incident and show their responses using the 3D models, and the instructor facilitated

the discussion and gave feedback right after the students' decision.

Knowledge of each core capability was tested by four multiple-choice questions. The interest in learning disaster medicine and willingness to participate in MCI management were evaluated by questionnaire, along with quantitative feedback to the exercise. The same test and questionnaire were conducted before and after the TTx.

**Results:** From September 2018 to May 2022, 326 students completed both pre- and post-exercise evaluations. The test scores of all five core capabilities, levels of interest, and willingness increased significantly after the exercise. Students thought the exercise was interesting and a good learning tool. Most students wanted to be notified of further training.

**Conclusion:** A tabletop exercise using 3D models is an effective way to teach senior medical students MCI management and disaster medicine while increasing their interest in learning and willingness to participate.

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### Triage Accuracy Rates Using the New MCI Triage System of Regione Piemonte: What's New?

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**Introduction:** An adequate Mass-Casualty Incident (MCI) triage system is essential to provide the best possible health care to the greatest number of affected people and to optimize the management of the available resources in the context of a MCI.

**Method:** In February 2022, Disaster Medicine Service 118 of Regione Piemonte adopted a new 5-color code-MCI triage system and Emergency Medical System (EMS) personnel was trained through a 3-hours-distance learning course. 515 medical doctors and nurses attended the course and completed the final test (triaging of 50 computer-based simulated patients/cases). Their performance was compared to intended triage designations. We collected the data and conducted a descriptive observational study.

**Results:** A total of 25.750 evaluations were carried out: 1.030 white cases, 6.180 green cases, 6.180 yellow cases, 9.270 red cases and 3,090 black cases. Overall triage accuracy was 89,63%. The overall errors were 2.671 (10.37%). Concerning the type of error, there were 1.415 cases under-triaged (5.5%) and 1.256 cases over-triaged (4.88%). Based on color-code, the highest rate of error was in green cases (3.48%), while black patients showed the highest accuracy rate (0.32%). Based on type, the most frequent error was under-triage of red patients, while the less frequent was over-triage of black patients.

**Conclusion:** The results of the final test performed by EMS personnel showed the accuracy rates of triage using new 5-color code-MCI triage systems of Regione Piemonte to be in range with data reported in the literature. A study limitation is the fact that the data analyzed are derived from online testing performed

in no-time limited and no-stress conditions. Another potential limitation is the distance learning which doesn't allow a discussion with the teacher or a request for clarification. For this reason, we would plan a future study defining the efficacy of the didactic methodology in comparison with face-to-face courses.

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### Development of a Learning Support System for Acquiring Disaster Nursing Competencies Required in the Acute Phase of Disaster

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**Introduction:** The purpose of this study is to develop a disaster nursing learning support system and a list of learning contents developed by our team to effectively and efficiently acquire the necessary disaster nursing competencies in the acute phase of disasters.

**Method:** As the first step, based on the ICN Framework of Disaster Nursing Competencies, we examined the teaching materials using nine competencies extracted through prior literature, interviews with disaster nursing practitioners and reviews of disaster nursing experts. Next, we extracted learning contents that are considered difficult to learn in daily work from textbooks used in disaster relief nurse training. We gained new information on disasters using interviews with experts and internet search review literature.

**Results:** Educational materials, including links to five open access sites, a summary of basic knowledge and original videos (case reports on dispatching disaster relief nurses, lectures on evacuation center management by experts, triage using the START-method and the PAT-method, psychological first aid, handling medical records and J-SPEED+ apps), were implemented. A test as an entry point for learning, a rubric to check current learning achievement, learning confirmation tests for each competency, a forum as a place for exchanging opinions among the learning community and an automatic certificate issuance system were set up.

**Conclusion:** Disaster nursing is an extension of daily nursing, and many matters can be learned in daily work. There are few things that general clinical nurses should learn in addition as this study showed. However, it is inferred that it is not easy to select and update the knowledge and information that nurses need from the abundance of data available in the information society.

It is meaningful to have a learning support system that allows nurses at medical institutions that are expected to collaborate in the event of an emergency to learn together during the silent phase.

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