

Feasibility and Effectiveness Assessment of the New Triage System Adopted by the Disaster Medicine Service of Regione Piemonte: Results of a Controlled Randomized Study

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Introduction: Validation of the new MCI Triage protocol of Regione Piemonte by comparing it with the already published and internationally used START/Jump START protocol. Compare its accuracy, execution time, over and under triage indices and the influence of any rescuer characteristics in reference to adult and pediatric victims when in use in a simulated multi-casualties event setting.

Method: We conducted a randomized controlled experimental study in a simulation setting. A group of 35 people involved in an incident (volunteer participants) was assessed by a population of trained and untrained healthcare professionals (nursing students and nurses). The participants were randomly divided into two homogenous groups to which the two protocols were explained separately and carried out the simulation in single-blind. Evaluation data were collected and statistically processed. The resulting items were used to compare the accuracy, over- and under-triage rates and any items related to rescuer characteristics for each triage system.

Results: 74 subjects were included in the study. Of these, 56.7% were healthcare professionals in training and 43.4% were trained nurses. Compared to standard criterion definitions, the MCI triage protocol showed a higher accuracy rate than START (88.4% vs 80.4%, $p < 0.01$). MCI triage had a significant lower rate of underestimation compared to START (8.9 vs 13.6%, $p < 0.01$) as well as overestimation (3.2% vs. 6.8%, $p < 0.01$). Time is only correlated with the performance of MCI triage, influencing its accuracy. There were no significant differences in the accuracy of diagnosis in pediatric patients.

Conclusion: We found that MCI method triaged adult patients more often correctly than START method. Underestimation and overestimation were lower than in the control method, although there tended to be a significant overestimation of white codes which were not present in the START system. In the assessment of pediatric patients, the protocols are equivalent.

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Using a Tabletop Game to Teach Emergency Department Nurses Comprehensive Emergency Management and Hazard Vulnerability Analysis: Influences and Possible Reasons

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Introduction: Comprehensive emergency management (CEM) and hazard vulnerability analysis (HVA) are two vital concepts in hospital emergency management (EM). Teaching these two concepts by lectures may be less effective and interesting. Therefore, a tabletop game was used to teach CEM and HVA. This study aimed to evaluate the effect of teaching and possible reasons.

Method: A tabletop game was created based on the concepts of CEM and HVA. Players of the game needed to manage hospitals against six kinds of emergencies. The impact of each emergency is different. Each hospital in the game has its vulnerability. The game players needed to use different strategies of prevention, mitigation, preparedness, response, and recovery to win the game.

The player's knowledge was tested by 15 yes-no questions (10 points for each question). The interest in further learning and willingness of hospital EM participation were evaluated by questionnaire. The test and questionnaire were conducted before and after the game. Possible reasons for learning by the game were surveyed after the game.

Results: Fifteen emergency department (ED) nurses were taught by the game and completed both pre- and post-game tests and questionnaires. The post-game test average score (103) was significantly higher than the pre-game average score (84) ($p = 0.008$). The participants' interest and willingness also increased significantly after the game. The most frequently mentioned reasons for learning by the game were "the game is more interesting than lectures", "the chance to discuss with other participants in the game", "the chance to see many CEM methods in the game", and "ability to compare with other players".

Conclusion: A well-designed tabletop game can be an effective tool to teach CEM and HVA. The game can increase knowledge, interest in learning, and willingness of CEM participation, and it should be promoted in the future.

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Novel Design of an Austere Medicine Elective

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Introduction: Clinicians with knowledge, skills and attitudes required in austere environments better serve their patients regardless of setting. Few opportunities traditionally exist for medical students to learn about wilderness, disaster medicine, or environmental illness. Events related to climate, disasters, and COVID-19 reinforce the need for physicians to develop

tools for practice in resource-limited settings. We created a medical student elective which delivered core content related to wilderness medicine, environmental illness and disaster preparedness and response, along with overarching skills including improvisation, teamwork, and resource allocation.

Method: Content experts partnered with educational design specialists to create a new student experience. We identified key impact areas using an analysis of courses at peer institutions, informal surveys, and published literature. Learning objectives were informed by relevant skills and content, as well as the cross-cutting goal of teaching students to perform in resource-limited settings.

A four-week curriculum was conceptualized, including lectures, workshops and skill sessions, synchronous and asynchronous online experiences, and a five-day backcountry trip focusing on *in situ* simulation and skills training. The course was offered in May 2021 and May 2022. Students completed post-course surveys regarding the utility of course elements, as well as teaching effectiveness.

Results: Overall satisfaction was 3.64/4.00. Self-reported competence increased in the domains of diagnosis and pathophysiology, treatment, teamwork, and resource management and improvisation. Qualitative data suggested that students are generally under-exposed to wilderness, environmental and disaster content. Self-reported helpfulness of learning activities was greatest for small-group outdoor workshops, and least for large teleconference-based sessions.

Conclusion: Strengths included interactive coursework reflecting teamwork, open access learning modules, and rubric-based assessment structures. Limitations include pandemic-related restrictions in group activities as well as limited objective measurements of knowledge and skills. Future goals include increasing in-person learning, dissemination of the curriculum to larger groups of learning, and development of reproducible performance measures.

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Medical Students' Education in Disaster Medicine: A Systematic Literature Review of Existing Curricula

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Introduction: Disaster Medicine (DM) is currently underrepresented in medical schools' curricula worldwide, and existing DM courses for medical students are extremely heterogeneous due to the lack of pragmatic and standardized guidelines. Moreover, there is a gap in knowledge regarding the curriculum development methodology used for DM courses. This study aims to identify DM courses for medical students worldwide and to map their curriculum development methodologies by reviewing available literature.

Method: The search was conducted on three databases using the terms "Disaster medicine" AND "Education". Following the PRISMA approach, twenty-five articles that described the content and implementation of DM curricula were included in the analysis.

Results: Nine studies thoroughly described the curriculum development process. Expert opinion and literature review were the methodologies mostly used to develop DM curricula. Only four studies followed a multi-method process made up of four different methodologies, including expert opinion, literature review, survey, and Delphi methodology. Most of the courses adopted a face-to-face approach combining different training modalities, including the use of virtual reality simulations and drills.

Conclusion: This systematic review provides a compendious analysis of the curricula and curriculum development processes in DM training for medical students. The scarce usage of reproducible, comprehensive curriculum development methodologies and consequently a great heterogeneity of the covered topics and course design were brought forward. Therefore, there is a need for standardization in DM education. Overall, this systematic review highlights the need for evidence-based educational curricula in DM and provides recommendations for developing DM courses following a scientific approach.

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Analysis of Delphi Study Seven-Point Linear Scale Data by Parametric Methods—Use of the Mean and Standard Deviation

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Introduction: The Delphi technique is a unique survey method that involves an iterative process to gain consensus when consensus is challenging to establish and is widely used in Disaster Medicine research. Participants typically rate a variety of statements using a specified rating scale. The survey is repeated for several rounds, and at each round statements that do not reach a predefined level of consensus are advanced to the next round while giving the participants information about the responses of other participants for their comparison. The final statements are then ranked in order of the average rating. The statistical methods to analyze Delphi studies are not well described. This study investigates the use of a 1 to 7 linear rating scale along with parametric summary statistics for assessment of consensus and ranking of statements.

Method: A study set of 9297 individual ratings on the 1 to 7 scale were obtained from previously performed Delphi studies and used to create 490,000 simulated Delphi ratings with various numbers of participants.