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Featured Article

Impact of Virtual Simulation to Teach Concepts of Disaster Triage

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Abstract

Background: At a time when major disasters are occurring with increasing frequency, nurses must understand principles of disaster triage. The aim of this study was to determine the impact of a virtual simulation to teach nursing students concepts of triage using the Sort, Assess, Lifesaving Interventions, and Treatment/Transport model.

Method: Using a mixed methods approach, six Bachelor of Science in Nursing students participated in a Web-based, virtual simulation of an earthquake. Students took a 20-item, multiple-choice test before and after the simulation and participated in a debriefing session.

Results: A Wilcoxon signed rank test suggested no statistically significant improvement on the post-test ($p = .168$). Qualitative data revealed the following themes: (a) Fun, (b) Appreciation for Immediate Feedback, (c) Better than Reading, and (d) Technical Issues.

Conclusions: With the improvement in technology and further educational research efforts, use of virtual simulation may be a teaching solution.

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Nursing represents the largest health care profession, and nurses are active members of multiple community organizations. They are ready to contribute to national disaster response efforts. At a time when major disasters are occurring with increasing frequency, it is essential that nurses understand principles of disaster triage and are able to apply them appropriately. Disasters directly affect nurses—be it on ground zero or in the hospital setting—from front-line triage to increasing one's patient load or leading evacuation efforts. Preparing nursing students for a mass-casualty event is challenging for nurse educators utilizing traditional teaching methods. In-person simulation is a preferred method for teaching triage; however, it is resource intensive. To simulate a disaster scenario requires significant logistical challenges both with supplies and personnel. Resources include a team for preplanning, setup and cleanup, space allocation, manikins, multiple human victims, supplies, moulage, facilitators, and dedicated time for the event itself. Virtual simulation may be a solution to successfully teach the principles of disaster triage with limited resources. The aim of this study was to determine impact of a virtual simulation to teach nursing students concepts of triage.

Key Points

- Facilitating an in-person disaster simulation can be resource-intensive.
- Virtual simulation may be a low-resource solution to teach principles of triage.
- All students expressed enthusiasm about the simulation - stating it was fun and better than reading.

Background

Models of Triage

Although various models of triage exist, SALT has been endorsed as the standard for the United States (Jones et al., 2014). SALT stands for Sort, Assess, Lifesaving Interventions, and Treatment/Transport. ''In 2006, the National Association of EMS Physicians (NAEMSP), with funding from the Centers for Disease Control and Prevention (CDC), convened a work group of subject matter experts from national stakeholder organizations, to examine the science supporting existing mass-casualty triage systems and make a recommendation for the adoption of a single system'' (FICEMS, 2014, p. 4). It was from this work group that the SALT model emerged. SALT has been endorsed as the guideline for mass-casualty triage for adult and pediatric patients (Jones et al., 2014). Jumpstart (simple triage and rapid transport) is another model for triage; however, it is designed for pediatric patients.

Several studies have used in-person simulations to evaluate models of triage (Deluhery, Lerner, Pirrallo, & Schwartz, 2011; Jones et al., 2014; Lerner, Schwartz, Coule, & Pirrallo, 2010). Lerner, et al. (2010) performed a prospective observational study to determine the accuracy of SALT triage during a simulated mass-casualty incident. The providers found SALT triage easier than their current triage system and felt more confident in their skills after the triage exercise. Jones et al. (2014) conducted an experimental study to determine whether SALT was comparable to Jumpstart in terms of accuracy and time to triage. The authors concluded that both SALT and Jumpstart appeared to have good ease of use. Deluhery, et al. (2011) sought to determine understanding and accuracy of SALT with 159 paramedics. The authors concluded that the paramedics were able to accurately assess patients after training and retained this knowledge 4 months later.

Mass-Casualty Simulation with Virtual Reality

Andreatta et al. (2010) compared the impact of two simulation-based methods for training emergency medicine residents. They found that the virtual reality group performed similarly to the standardized patient drill group of residents. Heinrichs, Youngblood, Harter, Kusumoto, and Dev (2010) investigated whether a virtual emergency department designed after an emergency department was an effective way to train physicians and nurses. With 10 physicians and 12 nurses, they found that confidence increased after the training (from 18% feeling confident initially to 86% feeling confident after the training). Fifty-nine percent of subjects attributed this change to the virtual simulation. Cohen et al. (2013) conducted a cohort study with clinicians to determine feasibility of low-cost virtual world environments for preparation and training in a major incident response. They found that the three scenarios were successfully tested with 95% of participants expressing a desire to use virtual environments in the future.

Pucher et al. (2014) assessed feasibility of a virtual worlds—based system for assessment and training in major incident response. With 21 subjects participating in three simulations, they found the novices committed more critical events (related to resource allocation, patient prioritization, or decision-making) than the experts (11 vs 3, $p = .006$) and took longer to treat patients (560 vs 339 seconds). All subjects thought that the simulation was realistic and superior to the existing training options. Wilkerson, Avstreih, Gruppen, Beier, and Woolliscroft (2008) performed a descriptive study to better understand the possible utility of an immersive virtual reality simulator for training first responders in a mass-casualty event of a terrorist explosion during a football game. With 12 paramedics, they used the cave automatic virtual environment (CAVE). CAVE entailed the use of lightweight liquid crystal display shutter glasses integrated with projection of images on