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Featured Article

Effect of Repeated Simulation on the Quality of Trauma Care

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KEYWORDS

simulation;
learning;
experience;
ambulance;
prehospital emergency
care;
trauma

Abstract

Background: Simulation participants are not dependent on learning during an actual clinical situation. This allows for a learning environment that can be constructed to meet the knowledge and experience needs of the participant. Simulations in a prehospital emergency are an ideal way to address these needs without risking patient safety.

Method: Nurses in prehospital emergency care (n = 63) participated in simulation interventions. During the simulation, the performed trauma care was assessed in two groups of participants with different frequency of simulation.

Results: Several statistically significant differences and clinical improvements were found within and between the groups. Differences were noted in specific assessments, examinations, care actions, and time from assessment to action.

Conclusion: The result suggested that repeated simulation may contribute to a clinical improvement in trauma care, and more frequent simulation may led to even greater improvements.

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Declarations.

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This study examined the effect of participating in trauma simulation on trauma care skills of nurses in prehospital emergency care. The mortality among patients exposed to high-energy trauma is very high. The body is suddenly in an extremely stressful and fragile condition, in which many organ systems may fail concurrently. This aggravated and time-sensitive situation is frequently complicated by profuse bleeding and serious and extensive tissue damage. Caring for a highly vulnerable patient in

this context is a complex and often demanding task for the nurse arriving at the scene. Therefore, simulation of high-energy trauma situations provides an opportunity to educate nurses as if on the scene, either before encountering the actual clinical work or after, as continuing education (Axelsson, Jimenez Herrera, & Bång, 2016).

Key Points

- To practice trauma care knowledge and skills with detailed objective assessment, can manifest the ABCDE knowledge of the nurse in prehospital emergency care.
- During repeated trauma simulation, there were statistically significant differences and clinical improvements of trauma care in the prehospital context.
- An individual objective assessment and a debriefing facilitating learning through reflections could ensure good-quality trauma care.

Background

The nurse in the prehospital emergency care assesses and performs necessary life-saving interventions and care for the patient at the scene of the accident and during transportation to the hospital. The nurse's knowledge and prehospital emergency care skills are critical for patient survival and reduction of patient morbidity and mortality (Wilson et al., 2015). However, conducting care in the prehospital trauma context is challenging to manage, for example, limited information about the patient's medical history prevents a

deeper knowledge and understanding of the patient's needs for care (Axelsson et al., 2016; Suserud, 2005).

Training in prehospital trauma care can be achieved by simulation. With simulation, the participants are no longer dependent on learning while in an actual trauma situation. Scenarios are constructed according to the participants' knowledge and experience level (Motola, Devine, Chung, Sullivan, & Issenberg, 2013). Thereby, skills are rehearsed and maintained although they are not frequently used in clinical practice (Dieckmann, 2009; Gallagher & Henn, 2014).

Benefits of simulation in health care are well documented and include improvement in psychomotor skills, communication skills, assessment, and management skills (Nestel & Bearman, 2015; Yuan, Williams, & Fang, 2012). Prior foci of research on simulated trauma care have revolved around simulation as a method for education, evaluation of staff performance, and evaluation of work environment (Abelsson, Rystedt, Suserud, & Lindwall, 2014). Airway, Breathing, Circulation, Disability, and Exposure (ABCDE) has, to our knowledge, rarely been researched.

The aim of the study was to examine the association between the frequency of trauma simulation and the effect

of trauma simulation on the trauma care skills of nurses in prehospital emergency care. The hypothesis was that, after the simulation period, the trauma care skills in a group simulating four times during a six-month period would be better than the trauma care skills in a group simulating two times during the same period. In the research process, trauma care skills were represented by the scores on an instrument measuring clinical competence.

Ethical Considerations

The study followed the ethical principals in accordance with the Declaration of Helsinki (2013), regarding anonymity and integrity. University institutional review board provided the ethical approval for this study. Each participant provided their consent. No unauthorised person had access to the material.

Method

This study was an intervention study. Simulation of patients exposed to high-energy trauma was conducted in two separate groups. Group A completed each of their four simulation scenarios (i.e., scenarios 1, 2, 3, and 4) with one simulation occurring every eight weeks. Group B completed only the first and last simulation scenarios (i.e., scenarios 1 and 4) with a time interval of six months (Figure 1).

Simulations 1 and 4 is in the study described as the first and the last simulations. The frequency of which the simulations were conducted was determined in consultation with a prominent researcher in the field of simulation. Two separate evaluations were conducted, one during the first and one during the last simulation. The evaluations enabled a comparison of the two groups A and B. The purpose of having two groups was to explore whether the frequency of simulation was related to the participants' trauma care abilities. In this article, the reporting follows the guidelines according to Cheng et al. (2016).

| Scenario | | Group A | Group B |
|----------|---|---------|---------|
| 1 | Severe injuries to extremities in the form of bilateral open femur fractures and closed pelvic fracture as a result of a fall of 4 meters. Patient bleeding extensively. | X | X |
| 2 | High spinal injury as a result of a dive head-first into the shallow end of the pool. Patient going into spinal shock. | X | |
| 3 | Two penetrating abdominal wounds as a result of a stab by a pair of scissors causing one open, bleeding, cavity and one cavity with intestines pressing out. | X | |
| 4 | Severe injuries to extremities in the form of bilateral open femur fractures, closed pelvic fracture and an open humerus fracture as a result of a motorcycle accident. Patient bleeding extensively. | X | X |

Figure 1 Scenarios conducted during the four simulations.

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