

Research Paper

The Impact of Trauma Simulation on Pre-Hospital Emergency Operations Staff



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Citation Bozorgnejad M, Najafi T, Haghani Sh, Nazari P. [The Impact of Trauma Simulation on Pre-Hospital Emergency Operations Staff (Persian)]. 2022; 35(1):106-117. <http://dx.doi.org/10.32598/ijn.35.1.2915.1>

doi <http://dx.doi.org/10.32598/ijn.35.1.2915.1>



ABSTRACT

Background & Aims Trauma is the main cause of death and disability in the world. Pre-hospital care is the first line of trauma care and treatment. Pre-hospital emergency services include immediate actions to save lives. Simulation allows employees to acquire basic skills in thinking, evaluating, solving problems, making decisions and analyzing data.

Materials & Methods This is a quasi-experimental study with a pre-test/post-test design. The participants were 60 pre-hospital emergency staff selected from among 200 staff of Fars pre-hospital emergency center. The simulation training was based on an educational model. The clinical skills of the participants in dealing with trauma patients was evaluated by the Objective Structured Clinical Skills Evaluation method in nine areas. After the training, the skills were re-evaluated and analyzed in SPSS v. 22 software.

Results The lowest mean score (from 0 to 100) was related to the skill of using traction splint (71.01±18.73) and the highest score was related to the skill of bleeding control and shock treatment (81.04±22.75). The results of the paired t-test showed that the overall clinical skill and nine standard skills of dealing with trauma patients were significantly increased after simulation training (P<0.001).

Conclusion The simulation training can increase the skills of pre-hospital emergency staff in dealing with trauma patients.

Received: 09 Jul 2021

Accepted: 21 May 2022

Available Online: 01 May 2022

Keywords:

Trauma,
Pre-hospital
emergency,
Simulation, training

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Extended Abstract

Introduction

Trauma is a leading cause of death and disability worldwide. Pre-hospital care is the first part of the trauma treatment and care system. Improving the skills of caring for trauma patients before they arrive at the hospital can significantly impact the survival of critically ill patients. Simulation enables employees to use learning, cognitive and psychological learning experiences. Simulation of trauma casualties causes subjective and objective changes among operational staff and, in fact, casualty care, which is a positive result of pre-hospital trauma life support (PHTLS) simulated courses. This study aimed to evaluate the skills of pre-hospital emergency operations staff in dealing with a trauma patient after performing simulation training.

Materials & Methods

This study was a quasi-experimental evaluation with a pre-test-post-test design. The research environment was Shiraz Medical Emergency and Accident Management Center. Sampling in 2019 was done by simple random method among 200 pre-hospital emergency staff. To determine the required number of samples at a confidence level of 0.95 and a test capacity of 80% and assuming that the skills of dealing with trauma patients in prehospital emergency operations staff after simulation training change at least eight points to be considered statistically significant. After placement in the relevant formula, the required sample size of 50 persons was obtained, which was supposed to be 60 people, considering the 20% drop. Staff performance in terms of clinical skills in dealing with trauma patients was evaluated by the Objective Structured Clinical Skills Evaluation (OSCE) method in 9 stations. The performance of clinical skills in dealing with trauma patients was assessed to collect data from the observation checklist and used by evaluators. In total, this workshop was held for 2 days. After passing theoretical and practical simulation training, the staff was tested with several scenarios based on the patient's condition. Immediately after the training, the clinical skills of the staff were re-evaluated based on their participation in the OSCE test and with the checklist of clinical skills for dealing with patients with trauma. Pre-test-post-test data were adjusted in the initial tables. Then skills were assessed using descriptive statistics (frequency, percentage, mean and standard deviation) and inferential statistics (paired t-test and Cohen effect size) by SPSS v. 22 software.

Results

Most of the subjects were men (88.5%), single (56.9%), and in the age group of 20 to 30 years (56.9%). Most of the prehospital emergency operatives in the study had nursing or emergency medical records (84.6%), a history of trauma training (59.6%), and a history of activity in the prehospital emergency (90.4%). The average total skill score of prehospital emergency operations staff in the face of a person with trauma before training was 40.51 with a standard deviation of 11.93, which was lower than the mean score of the instrument, i.e., 74.5.

To compare 9 skills, scores were calculated from 0 to 100. The results showed the lowest mean score was in oral-tracheal ventilation and intubation skills (20.78 16 16.11) and the highest in restricted spinal movement restriction skills. (36.20 36 36.32). The average total skill score of prehospital emergency operations staff in the face of a trauma patient after training was 113.17 with a standard deviation of 10.24, which was higher than the average score of the instrument, i.e., 74.5. The results showed that the lowest mean score obtained based on zero to one hundred was using a traction splint (71.1 73 18.73), and the highest was controlling bleeding and shock treatment (81.4 75 22.75).

The paired t-test showed that general clinical skills and 9 standard skills of dealing with trauma patients in prehospital emergency operations staff after simulation training were significantly higher than before ($P < 0.001$). The results of Cohen's effect size showed that the highest effect of the intervention was on the examination of the trauma patient (3.33) and the least on the limitation of the patient's spine movement (1.55) and in general in the standard skills of dealing with trauma patients was 4.64.

Dissection

The results showed that the clinical skills of prehospital emergency operations staff in dealing with a trauma patient had increased after simulation training. All nine skills and general skills were significantly higher ($P < 0.001$). Statistical results show that training by trauma simulation method increases the total score of clinical skills in coping with trauma. According to the results, simulation-based training was effective in improving the skills of prehospital emergency operations staff. Therefore, this new educational method can be used to teach and learn more effectively and take steps to provide quality and safe care for patients. This training allows participants to experience a critical emergency without compromising patient safety. Using this training method and encouraging employees

to participate in it in the form of continuous training while using this new training method will improve the clinical skills of operational staff.

Ethical Considerations

Compliance with ethical guidelines

Obtaining the approval of the ethics committee with the code IR.IUMS.REC.1398.587 and obtaining a license from the research Vice-chancellor of [Iran University of Medical Sciences](#) and Health Services.

Funding

The present study was a part of the master's thesis of the emergency nursing field of Iran University of Medical Sciences and Health Services, which was carried out with the financial support of the Research Vice-Chancellor of [Iran University of Medical Sciences](#) and Fars Emergency Center.

Authors' contributions

Research: Mehri Bozorgnejad, Peyman Nazari; Project Supervision and Management: Tahereh Najafi Ghezeljeh; Analysis: Shima Haqqani; Drafting, editing, and finalization Written by: Peyman Nazari.

Conflict of interest

The author(s) declare that they have no conflict of interest.

Acknowledgments

Fars Medical Emergency and Accident Management Center is appreciated and thanked.