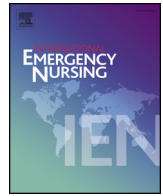




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Analysis of the effects of high-fidelity simulation on nursing students' perceptions of their preparedness for disasters

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ABSTRACT

Introduction: As disasters may occur any time, health care staff and institutions should be prepared to manage these events. The aim of study is to analyze the effects of high-fidelity simulation on the perceptions of senior nursing students regarding their preparedness for disasters.

Methods: This study used a pretest-posttest design and was conducted as a quasi-experimental investigation.

Results: Slightly less than the half of the students (42.5%) expressed that they were prepared to face a disaster. There was a statistically significant difference in their scores on the Scale of Perception of Disaster Preparedness among Nurses between the pre-intervention and postdisaster stage ($p < 0.05$).

Conclusion: Supporting simulation activities with drills positively affected nurses' perceptions of disasters.

1. Introduction

Disasters damage people's property and threaten individuals' lives, and they have increased in prevalence worldwide. "Natural disasters and manmade disasters have very significant effects on individuals' health and their physical, emotional and psychological well-being" (p.65). To effectively manage the negative consequences of disasters, appropriate management strategies should be developed and implemented [1].

As disasters can occur any time, health care staff and institutions should be ready to manage these events [2]. The World Health Organization (WHO) recommends that health care professionals in all countries be trained in how to address disasters, regardless of the frequency of these events in their country [1,3]. The fundamental endeavors of nursing practice are to provide care to the injured or ill, to assist individuals and families in treating physical and emotional issues and to work to improve the community's health and well-being [4].

The word "disaster" refers to a sudden, overwhelming and unforeseen event. There is no single agreed-upon definition of a disaster, and multiple definitions are found in the literature [5]. The definitions from the International Strategy for Disaster Reduction (ISDR), the International Federation of Red Cross and Red Crescent Societies (IFRC) and

the World Health Organization are examples of how various organizations define disaster. Disasters are defined as a serious disruption of the functioning of a community or society causing widespread human, material, economic, or environmental losses that exceed the ability of the affected community or society to cope using its own resources [6]. Nurses have significant responsibilities and play an important role in disasters because they constitute the majority of health care personnel. For instance, the International Council of Nurses (ICN) (2006, p. 13) describes the value of nurses' involvement in disasters as follows: "Nurses, with their technical skills and knowledge of epidemiology, physiology, pharmacology, cultural-familial structures, and psychosocial issues, can assist in disaster preparedness programs, as well as during disasters. Nurses, as team members, can play a strategic role cooperating with health and social disciplines, government bodies, community groups, and non-governmental agencies, including humanitarian organizations" [7].

Therefore, during their undergraduate studies, nursing students should receive training for their roles in disasters. Undergraduate programs should incorporate training methods that provide the core competencies for nurses in relation to disaster preparedness. Simulations and drills also play an important role in disaster preparedness [8].

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Simulation is a learning and teaching strategy that is commonly employed in health-related education. High-fidelity simulation provides nursing students the opportunity to practice, develop, and apply knowledge and skills in a realistic clinical situation while remaining in a safe environment [9]. The term “simulation” has been defined in different ways. Simulation is a strategy that is designed to represent procedures, decision-making procedures and critical thinking and helps nursing students learn during the pre-service period through imitations of real patient cases [10]. Gaba stated that “simulation is a technique, not a technology, to replace or amplify real experiences with guided experiences, often immersive in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion” [11].

Simulation is known for its ability to standardize patient conditions and to implement them consistently [10]. The use of simulation training for disaster preparedness combines theoretical knowledge and clinical skills and provides an invaluable experience for nursing students [12]. In addition, simulation enables nursing students to improve their clinical skills without risking patient safety [10]. Simulation is a teaching method that reinforces learning and provides long-lasting learning. In terms of disaster training, simulation is one of the most accessible techniques and is also cost-effective [13]. In disaster simulations, the participants learn how to manage the care services for injured people, to triage patients, to research cases more effectively and make corresponding decisions and to develop procedures [14]. These skills are the reasons simulations are commonly used in disaster training, and it is widely argued that simulations improve trainees’ knowledge, skills and performance [10].

Simulation-based education employs simulation techniques, which can be lower, medium or high fidelity. Lower-fidelity simulation education consists of the use of mannequins (as a part-task trainer) to improve psychomotor skills. Simulation education with higher fidelity involves the use of both mannequins and simulated patients. Simulated patients are individuals who are trained to act as real patients to simulate a set of symptoms or problems during the practice case or scenario [15].

Research suggests that disaster training provided by nurse trainers through simulations is desirable because it improves the skills of nursing students [16]. Nurses are among the first health care professionals to encounter and help terrified, injured or dead people after disasters. In addition, nurses compose the majority of health care personnel and have important roles during disasters. Furthermore, nurses help to educate individuals about disasters and improve their disaster preparedness [1]. Therefore, nursing students should receive disaster preparedness education to help them increase people’s awareness of how to manage disasters [2,17]. Through this education, nurses can become competent in disaster preparedness and equipped with the necessary information and attitudes towards disasters. In addition, improving nurses’ disaster perceptions is an integral component of the activity planning and measure development process. Nurses’ perceptions also contribute to the effective planning and implementation of health care activities during disasters. Thus, including disaster preparedness training in educational programs is critical. At the nursing school where the study was conducted, disaster preparation courses have been delivered for nearly ten years. The academic year when the study was performed was the first time that the simulation-based course was provided. The aim of this study was to analyze the effects of a disaster nursing course including a high-fidelity simulation program on senior nursing students’ perceptions of their disaster preparation.

2. Research questions

In parallel to the aims of the study described above, the study attempted to answer the following research questions:

- What are the preparedness levels and perceptions of senior nursing students regarding disasters?

- What are the effects of the method used in this study on senior nursing students’ preparedness levels and perceptions about disasters?
- What is the students’ feedback regarding the training method used?

3. Methods

3.1. Study design

This study used a pre-test-post-test design and conducted a quasi-experimental investigation. It was implemented within the framework of the “nursing practices in extraordinary conditions” course, which is provided to senior nursing students. The study was conducted at a nursing school in Turkey between April 2015 and June 2015.

3.2. Participants

The participants in this study were senior nursing students (n = 87). All the participants voluntarily participated in the study.

3.3. Data collection tools

The study data were collected through the use of three different tools. The first tool was used to collect the sociodemographic characteristics of the participants and their views on disaster preparedness. The second data collection tool was the Scale of Perception of Disaster Preparedness among Nurses (SPDPN), which was developed by Ozcan and Erol [18]. The scale comprises twenty items and has three major components: preparation stage (related items: 1 through 6), intervention stage (related items: 7 through 15) and post-disaster stage (related items: 16 through 20). The item responses were developed in accordance with a five-point Likert-type scale (1-completely disagree, 2-disagree, 3-partly agree, 4-agree, 5-completely agree). Cronbach’s alpha coefficient for the original scale was 0.90 [18]. In the current study, Cronbach’s alpha was 0.94. The scale was employed in the study as both a pre-test and a post-test measurement tool.

The third data collection tool was a survey questionnaire with twelve items. It was developed by the authors to collect the students’ feedback regarding the disaster simulation used in the study.

3.4. Procedure

The study followed seven steps: “pre-course preparation”, “pre-course evaluation”, “theoretical course”, “establishment of a mobile emergency first aid hospital”, “simulation activities”, “demonstration” and “post-course evaluation” (Fig. 1 Flow chart). Each step is described below:

3.4.1. Pre-course preparation

Pre-course preparation involved meetings with the faculty members assigned to the eight-week course. During the meetings, the following activities were planned: identifying the learning goals, developing scenarios, accessing the required materials for the scenarios, identifying the roles covered in the scenarios, designing moulage activities, preparing the types of event (road accident, fire, wreck, etc.) and preparing the mobile emergency hospital. In addition, a series of meetings was conducted to coordinate with the Republic of Turkey Prime Ministry Disaster and Emergency Management Presidency (Turkish: *Afet ve Acil Durum Yönetimi Başkanlığı, AFAD*) during the implementation of the drill.

The simulated patient, patient relative and bystander roles were voluntarily performed by the non-participating nursing students. Those playing the role of patients in the simulation and moulage activities were trained by the faculty members. The physical diagnoses of the simulated patients were presented on cards placed on their neck. In the area of the simulated incident, equipment such as real concrete piles,

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