

Proposal of a Model of Disaster Medical Education for Practical Risk Management and Disaster Nursing: The SINCHI Education Model

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Abbreviation:

IDR: international disaster response

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Abstract

Education in disaster nursing and risk management is important, and developing the human resources of medical staff who participate in disaster response is also necessary. However, a practical educational model for risk management and disaster nursing has not yet been established in Japan. In the present study, a model of disaster medical education for practical risk management and disaster nursing was proposed. Seventeen expert nurses with experience in practical international disaster response (IDR) participated in this study. They were recruited from among past members of Japan disaster response medical teams. They were asked an open-ended question through a questionnaire survey: “What kind of nursing education is necessary for risk management and practical activities in disaster response?” The responses were analyzed qualitatively and an educational model was developed. Sixty-five codes were obtained from the answers to the open-ended question, and they were categorized into 19 sub-categories and three categories. Subsequently, the “SINCHI education model” was proposed for practical disaster nursing education; it comprises six elements: (1) Simulation exercise and small-group work; (2) International nursing knowledge; (3) Nursing skills and knowledge, including disaster nursing; (4) Communication ability promotion; (5) Humanity, responsibility, and flexibility; and (6) Infection prevention and control. A sample of this education exercise model is the following: (1) preparing the list of medical staff members (2) information-gathering simulation (3) preparing the list of medical instruments, and (4) developing the plan for risk management and operation, including infection prevention and control. Disaster nursing education could be made more instructive and practical by including simulation exercises.

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Introduction

Large-scale disasters have frequently occurred in Japan since 1995 (after the Great Hanshin-Awaji Earthquake), and developing human resources and medical staff who can work in the disaster field is necessary. In particular, training nursing staff who possess knowledge of and skills in disaster nursing is extremely important.^{1–4} In the cases of large-scale disasters, while nurses helped in medically treating those injured after the disaster, there was a shortage of both medical manpower and resources such as medicine and supplies.^{1,2} Since 2009, the Japanese Ministry of Education and Culture (Tokyo, Japan) has strongly recommended that all nursing colleges teach disaster nursing for about 15–30 hours per year, as per the nursing education rule for Japanese nursing education. However, detailed educational methods for practical disaster nursing education including risk management have not yet been established.⁵

The increased number of natural disasters makes it vital for nurses to be taught the principles of disaster medicine and nursing;⁶ such education is the most effective when conducted through simulations during nurses’ on-going education.⁷ Japanese nursing colleges today provide disaster nursing education to their students. However, there are currently few studies that examine the most effective educational methods.⁸ The present study attempted to establish a model of disaster nursing education for practical disaster nursing and risk management. The findings have implications for future human resource development in disaster medical care.

Categories	Sub-Categories
Effective Methods of Education	Class room lecture
	Group work
	Simulation exercises using past disasters
	Small-group education for students aiming for international careers
	Field work in developing countries
	Career guidance for international nursing
	Experiences of international nursing
Contents of Effective Education	The culture, religion, and ethics of disputed territories
	Disaster nursing
	Logistic support
	Practical and professional nursing
	Basic nursing in clinical hospitals
	Epidemiology
	Infection
	Learning a language: English
Goals of Education	Developing skills for communicating with people from different cultures
	Developing clinical thinking
	Improving the ability to think about global issues
	Developing a sense of humanity, flexibility, and responsibility

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Table 1. International Nursing Education Considered Necessary for Basic Education by International Japanese Expert Nurses: Content Analysis

Education in disaster nursing and risk management is important, and nurturing medical staff who participate in disaster response are also essential. Thus, this study aimed to propose a model of disaster medical education for practical risk management and disaster nursing.

Methods

Seventeen expert nurses with experience in practical international disaster response (IDR) participated in this study. They were recruited from among past members of IDR teams and provided their informed consent. They were also the nurses who participated in a previous study concerning IDR operations.² All 17 nurses agreed to participate this study. The data were collected from June 2016 through December 2018. In the 17 subjects, the gender was six males and 11 females. The age was distributed from 30 to 59 years, and the average was 40.9 years old. Most of the subjects were in their 30s (10 nurses) or 40s (five nurses). Thirteen nurses belonged to Japan International Cooperation Agency (Tokyo, Japan), and four nurses belonged to non-governmental organizations. The years of experience in nursing distributed from five to 25 years, and the average was 16.1 years. They were asked the open-ended question: “What kind of nursing education is necessary for risk management and practical activities in disaster response?” by the mailing questionnaire. The responses were written in the questionnaire and their answers were analyzed qualitatively.⁹ The answered phrases were coded for the analysis. Subsequently, an educational model was developed.

Simulation: Simulation exercise and small-group work education.
International Nursing Knowledge: Guidance and sharing experience.
Nursing Education: General knowledge and skills, including disaster nursing.
Communication: Communication skills promotion, including the ability to use medical terms in English and communicate with people from different cultures.
Humanity: Education about humanity, ethics, responsibility, and flexibility.
Infection Prevention and Control: Knowledge and skills for preventing the outbreak of infectious diseases.

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Table 2. The Six Elements of the SINCHI Education Model for Disaster Nursing

1. Preparing the list of medical staff members:
For example, among a total staff of 20 members, what type of professionals should be included in the IDR team?
In the case of medical doctors, what abilities do they need?
Who should be the leader of the IDR team?
2. Information-gathering simulation:
What kind of information is necessary?
How do we obtain the information?
How do we evaluate the information?
3. Preparing the list of medical instruments:
If we plan to treat 300 patients per day, and stay for 14 days, what types of medical drugs and instruments are necessary? How much do we need?
4. Developing the plan of risk management and operation, including infectious disease prevention and control:
How do we ensure the security of the IDR team?
What types of infectious diseases have been pandemic in the local area in the past?
How do we prevent and control infectious diseases?

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Table 3. A Sample Exercise Based on the SINCHI Education Model (Sample Lessons)

Abbreviation: IDR, international disaster response.

Ethical Considerations

The study was reviewed and approved by the Faculty of Medicine, Saga University (Saga, Japan; approval no. 28-14). Nurses’ personal information, such as their name or address, were not sought in the answer sheets. The purpose of the study was explained to the participants and they were assured that refusing to participate or discontinuing their participation in the study would have no adverse consequences. All respondents agreed to participate by submitting their answer sheet.

Results

Sixty-five codes were obtained from the answers to the open-ended question, and were subsequently categorized into 19 sub-categories and three categories (Table 1). According to the results of the analysis, an education model comprising six elements derived from the essential sub-categories was proposed: (1) Simulation exercise and small-group work; (2) International nursing knowledge; (3)



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Figure 1. Simulation Exercise in Small-Group Work (Disaster Imaging Game).



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Figure 3. Exercise for Learning about the Doctor Helicopter in Saga University Hospital (Saga, Japan) and its Function.



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Figure 2. Using Videos of Past International Disaster Relief Operations for Visualizing Real Disaster Situations.



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Figure 4. Education about Cooperation with Military Medical Teams and Helicopter Staff.

Nursing skills and knowledge, including disaster nursing; (4) Communication ability promotion; (5) Humanity, responsibility, and flexibility; and (6) Infection prevention and control.

These six elements were considered especially important from the authors' experience of IDR and 15 years of providing education in disaster medicine in nursing colleges.

The model was named the SINCHI education model (Table 2). This name was derived from the first letters of the six elements. This name is easy to memorize and pronounce. A sample of this education exercise is the following: (1) preparing the list of medical staff members (2) information-gathering simulation (3) preparing the list of medical instruments, and (4) developing the plan of risk management and operation, including infection prevention and control (Table 3).

Discussion

The effectiveness of simulation in disaster nursing education has been reported in studies conducted in the United States of

America and India.^{10,11} Previous studies have also suggested the effectiveness of simulation education in disaster medical education and training.^{5,12} The educational model developed in the current study includes a simulation game (disaster imaging game) involving past IDR operations. For example, the Honduras international disaster relief operation in 1988 is one of the sample models. The first author of the study participated in that operation as a chief triage officer of the Japan Self-Defense Medical Team.¹³ Such types of actual, large-scale disasters are good sample teaching models in simulation education. Faculty members who have experience in IDR should teach disaster nursing using this education model.

As shown in Table 2, the SINCHI education model comprises six elements. First, "International nursing knowledge" is of critical importance for IDR operations. Further, in most cases, IDR operations are undertaken in developing countries. Hence, listening to the experience of and seeking guidance from the dispatched nurses is necessary. What type of information is necessary? How can this information be gathered? How can it be evaluated? These questions are good educational tools in disaster nursing education.

General nursing education, including disaster nursing knowledge and skills, is also of basic importance.

Communication skills with regard to people from different cultures is also an important element, because without these skills, one cannot perform IDR operations. Education about humanity, responsibility, and flexibility is also indispensable for medical staff who participate in IDR, because IDR is a humanitarian aid operation and the staff must work with limited manpower and medical equipment in the disaster field.^{1,2} In IDR, negotiation and cooperation with related organizations and coordination is extremely important; the so-called integration ability is considered necessary for the nursing staff involved in IDR. Finally, “Infection prevention and control” is also essential for IDR operations, because in most developing countries, local infectious disease outbreak is an immense problem that impedes effective IDR operations. Knowledge of infection control and prevention is one of the most necessary elements among IDR medical staff.

The six elements mentioned above were combined and a sample of the education model was developed (Table 3; Figures 1–4). In Japan, such a practical model of disaster nursing education has not

been established yet. The usage of this education model could promote disaster nursing education, not only in Japan, but also other countries globally.

Conclusion

The SINCHI education model was proposed for practical disaster nursing education. This education model, which includes simulation exercise, could be considered to be instructive and practical for training professionals in providing disaster nursing assistance globally.

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