

Literature Review of Disaster Health Research in Japan: Focusing on Disaster Nursing Education

Mayumi Kako, RN, PhD;¹ Satoko Mitani, RN, PhD;² Paul Arbon, RN, PhD¹

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1. School of Nursing & Midwifery, Flinders University, Adelaide SA, Australia
 2. School of Medicine, Kyoto University, Kyoto, Japan

Correspondence:

Mayumi Kako, RN, PhD
School of Nursing & Midwifery
Flinders University
GPO Box 2100
Adelaide SA 5001, Australia
E-mail: mayumi.kako@flinders.edu.au

Keywords: disaster nursing; Japan; literature review; research methodology

Abbreviations:

none

Received: December 05, 2011

Accepted: February 22, 2012

Revised: February 27, 2012

Online publication: May 17, 2012

doi:10.1017/S1049023X12000520

Abstract

Introduction: Japan has a long history of disaster due to its location on the “Pacific Ring of Fire.” The frequency of earthquakes experienced in recent years has had significant influence on disaster health research in Japan. This paper describes disaster health research trends in Japan, with an emphasis on disaster nursing research.

Method: A systematic literature review of disaster health research in Japan from 2001 through 2007 was conducted for this study. The most commonly used database in Japan, Ichushi (version 4.0), was used for this literature review. The keywords and sub-keywords used were: *disaster, disaster nursing, practice, education, ability, response, emergency, licensure, capability, function, prevention, planning and research*. These keywords were sometimes used in combination to identify relevant literature.

Results: A total of 222 articles were reviewed. The number of research papers available increased gradually from 2001 through 2007. The most common articles used were found using the search category of “*disaster nursing and research*.” Among the search categories, “*disaster nursing and education*” also had a high number of publications. This category also peaked in 2007.

Conclusion: The recent experiences of natural disaster in Japan accelerated the impetus to explore and implement a disaster nursing concept into practice and nursing curricula. Further evidence-based studies to develop methodology and other areas of studies in disaster nursing, including other language databases are to be expected in the future.

Kako M, Mitani S, Arbon P. Literature review of disaster health research in Japan: focusing on disaster nursing education. *Prehosp Disaster Med.* 2012;27(2):178-183.

Introduction

Japan has a long history of developing disaster planning systems due to both its geographical characteristics and the frequent occurrence of disasters in Southeast Asia. There were 2,909 reported disasters between 1999 and 2008 with 1,023,081 people reported killed during this period.¹ The Asian region has a high number of disasters, 38% of which occurred between 1975 and 2000, affecting as much as 88% of the population of the region.² This frequent occurrence of disasters becomes a serious socio-financial burden to the countries involved.

The frequency of earthquakes experienced in recent years has had a significant influence on disaster health research in Japan. Sakai and Kikuchi surveyed the trend of disaster nursing research and found that disaster nursing research articles have appeared in the literature since 1991.³ Their review demonstrated that disaster nursing research has become more diversified, reflecting the occurrences of various other types of disasters, such as the Sarin Gas underground incident in Tokyo, the Great Hanshin-Awaji earthquake of 1995, and the Great East Japan earthquake in 2011.

Disaster health research now has a broad area of focus, including areas such as disaster planning, disaster management, and community capacity building. Disaster health is a practice that also calls for multidisciplinary research, as emphasized by Kuroda and Sakai.⁴

Although the number of disaster health research articles has increased and the focus has expanded, the studies have not yet been systematically reviewed, particularly in Japanese nursing journals.

It is also not known if unique language usage exists that prevents the comparison of Japanese disaster nursing research findings with those of other countries. In order to determine the extent and focus of disaster health research literature, in particular disaster nursing research in the Japanese language, the authors reviewed the literature to

	Search										Total
	1	2	3	4	5	6	7	8	9	10	
2001	0	0	0	0	0	0	0	0	0	11	11
2002	9	0	1	0	3	0	3	0	0	8	24
2003	1	0	0	0	2	1	2	0	1	5	12
2004	4	0	1	0	2	2	1	0	0	10	20
2005	9	1	1	1	4	2	3	0	0	20	41
2006	10	2	2	0	7	3	1	0	1	30	56
2007	17	0	4	0	7	1	5	1	1	22	58
Total	50	3	9	1	25	9	15	1	3	106	222

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Table 1. Overview of literature search results

investigate tendencies and characteristics in current disaster health research. This report focused on the review of Japanese disaster nursing education literature.

Methods

Article Selection Process and Inclusion Criteria

A literature search was conducted using the Japanese database Ichushi (version 4.0). This database is the sole Japanese database of health professionals' research articles. The keywords or combinations of keywords used for this search were: (1) *disaster nursing, education*; (2) *function, disaster nursing*; (3) *practice, disaster nursing*; (4) *capability, disaster nursing*; (5) *disaster response, planning*; (6) *emergency, response, planning*; (7) *disaster prevention, disaster nursing*; (8) *licensure, disaster nursing*; (9) *ability, disaster nursing*; and (10) *research, disaster nursing*. Relevant literature published from 2001 through 2007 was chosen for review to capture that period in which there were increased numbers of disasters nationally and internationally. Translation from Japanese into English was performed by checking that the term and context used in the Japanese article were the same as those used in an English-language context. If this was not the case, the authors tried to search using the most comparable term. Only peer-reviewed, research-based articles on disaster nursing were included. "Grey literature," such as government reports and non-peer reviewed articles, was excluded.

Six of 10 searches resulted in duplicate articles. For example, the search using the keywords *function* and *disaster nursing* resulted in one duplicate article. Duplicate articles were used for analysis only at the first appearance in searches.

The information retrieved from each search was tabulated for data synthesis. Information from each reviewed article was synthesized according to themes to identify the issues and trends in disaster nursing articles in Japan. The results were also analyzed by year of publication to investigate trends. The articles were sorted into the following four themes: (1) learning outcome/experience; (2) drills and training in nursing education; (3) discipline/curriculum development; and (4) attributes of disaster relief nurses.

Results

A total of 222 articles were retrieved. Among the keyword search categories, the search: *disaster nursing and research* yielded the

largest number of articles (n = 106, 48%). This search also yielded articles published every year from 2001 through 2007 (Table 1). The smallest number of retrievals resulted from the search using the keywords *practice, capability, disaster nursing*, and from the search using the keywords *licensure and disaster nursing* (n = 1 in both categories). With the exception of the year 2003 and 2004, the number of research articles published in the area of disaster nursing increased gradually each year with the greatest number of articles published in 2007. After 2003, the number continued to increase, peaking in 2007.

Article search results are shown in Table 2. The 222 retrieved articles were sorted for data analysis. The articles that did not focus on a disaster context or a nursing context were excluded from analysis.

All retrieved articles from the search using the keywords *disaster nursing* and *research* were excluded from analysis; most of these articles (n = 82) overlapped with other search category results, with the 24 remaining articles not focused on nursing. The searches using the keywords *disaster nursing, education, practice, capability, disaster nursing, disaster response, planning and licensure, disaster nursing* did not yield articles that were duplicated in other searches.

The search using *disaster nursing* and *education* yielded the highest number of articles for analysis (n = 16). The content of these articles varied to include case study reports of evaluation of disaster educational courses,^{5-8,23} disaster drills,⁹⁻¹⁴ and discussion of disaster nursing as a discipline.^{17-19,22} As this is the main interest of this study, the authors concentrated on the results and analysis of this search.

Learning Outcome and Experience Articles

A summary of articles that were categorized as focusing on students' learning outcomes and experiences are shown in Table 3. With the exception of one article by Nimi and Horii, the articles focused on teaching styles.⁵ Ohara introduced triage education and training in nursing students' final year of clinical work.⁶ The self-evaluated results following the education showed that the triage decision-making of the final year nursing students was more accurate in some scenarios than that of registered nurses working in the clinical setting. Tozawa et al surveyed nursing students' abilities during a survival camping experience and

Search	Keywords	Articles Retrieved	Articles Selected to Analyze ^a
1	disaster nursing, education	50	16
2	function, disaster nursing	3	3 (1)
3	practice, disaster nursing	9	9 (1)
4	practice, capability, disaster nursing	1	1
5	disaster, response, planning	25	21
6	emergency, response, planning	9	5 (5)
7	disaster, prevention, disaster nursing	15	15 (7)
8	licensure, disaster nursing	1	1
9	ability, disaster nursing	3	5 (4)
10	disaster nursing, research	106	0 (82)
Total		222	76

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Table 2. Summary of keywords and number of articles retrieved and analyzed^aNumbers in parentheses indicate articles that overlapped with other categories.

Study citation	Methods	Key Findings
Tozawa et al (2007) ⁷	Questionnaire to 70 third-year students. Comparison between the group not having the seminar and the group that had the seminar (on camping experience)	The group experienced in camping (n = 33) and the group with no experience (control group, n = 37) indicated differences in the degree of disaster preparedness. The group experienced in camping showed a broader and deeper recognition process toward disaster preparedness.
Niimi and Horii (2004) ⁵	Five students' reports were randomly selected for context analysis. Face to face interviews were conducted with these students.	The result showed the nursing students' understanding of the importance of nursing, and basic nursing care such as triage, assessment of the casualty's physical conditions, and prioritizing their needs. These were also indications for professional nursing standards which students can obtain when they are in professional practice.
Motoyama and Sakaguchi (2003) ²¹	To investigate the degree of recognition of disaster hazard, surveys were distributed to the third-year students (n = not known). 113 returned surveys that were used for analysis.	Nursing students' recognition of hazards was higher in natural disaster than in man-made disaster. It was discovered that there was low recognition of disaster hazards in the students, as well as a lower preparedness for disaster.
Ohara (2002) ⁶	The armchair triage was conducted with final year nursing students as a component of acute care nursing. Questionnaire/evaluation after the seminar (the number of the questionnaires/evaluations collected not known).	Analysis of the self-evaluation form indicated that students recognized the importance of decision-making processes in triage, and had knowledge about this process. Only a summary of the study is available, and the statistical details are not known.
Ishikawa et al (2006) ⁸	Questionnaire/evaluation of the topic by the students (number of students unknown)	The context of the topic was evaluated by students, with 32 elements retrieved, including five elements that students had learned about while studying health needs in the community. The topic involved activities such as fieldwork and drills.

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Table 3. Summary of articles with the theme “learning outcome and experience”

compared the findings for nursing students with camping experience to the findings for those not experienced in camping.⁷ This descriptive report was a unique study illustrating students' experiences during challenging circumstances, and showed that life experiences may influence students' motivation to study disaster nursing. Ishikawa et al used a survey of nursing students to evaluate the topic “disaster nursing and the community.”⁸ She reported that

the use of group case studies was a valuable way to teach disaster nursing content. The inclusion of fieldwork as well as drills was important for students in obtaining practical knowledge.

Drills and Training in Nursing Education

Six articles were retrieved that focused on the issue of drills and training in nursing education (Table 4). The methods used for

Study citation	Methods	Key Findings
Bouta et al (2007) ⁹	Nursing students conducted the rally triage. Questionnaire given to the 280 final-year students after the triage training	The summary of the results show the importance of physiological knowledge in assessing patients. Students also showed improvement with experience in cases. It is also pointed out that students lack opportunities to experience decision-making in practice, and active involvement of students was suggested.
Hatayoshi et al (2007) ¹³	To develop a “checklist of the activities in disaster nursing,” the authors analyzed 32 students’ reports (second year students), and focused on the nurses’ activities in the report. Authors took the nurses’ activities and categorized them as non-verbal or verbal activities.	The investigators’ categorization of nursing activities indicated that basic nursing care involves both verbal and non-verbal activities. These are not specific to disaster situations, and these nursing skills are used in the daily nursing activities.
Imaeda et al (2005) ¹²	Semi-structured interviews were conducted with the students to investigate the students’ experience in an earthquake disaster drill.	The result showed that there are eight categories, such as preparedness for natural disaster, recognition of the hazards around the area and understanding approach/emergency in disaster situations.
Kumatani et al (2007) ¹⁴	Questionnaire to 31 second-year students to investigate the role of nurses and nursing students in disaster situation.	The finding shows that the role of nurses and the experience of the patients was an essential component of disaster preparation. Implementation of these topics into the disaster nursing curriculum was recommended.
Niimi et al (2006) ¹⁰	Analysis of 40 first-year students’ reports after a drill	The result of analysis showed the importance of the experience of drills and having concrete protocols — knowing what to do in an emergency situation was essential to increase the preparedness.
Yamamoto et al (2002) ¹¹	Report of students learning by participating in a drill (n = not known).	The report showed the importance of participating in the drill to experience the situation. Experience can make the students bring more concrete ideas to disaster situations.

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Table 4. Summary of articles with the theme “drills and trainings in nursing education”

Study citation	Methods	Key Findings
Matsumoto et al (2007) ²²	Questionnaire to 84 universities in 2004 to investigate the availability of disaster nursing courses in Japan.	Fifteen of the 61 schools responding had disaster nursing courses available.
Yamamoto et al (2007) ²³	Thirty-nine Red Cross schools in Japan were surveyed. Literature review, group discussion, and focus group conducted by disaster nursing experts.	Owing to the philosophy of the Red Cross, these schools provided education in disaster nursing. There are slight differences between the Red Cross and other schools, as they tend to combine disaster with other topics, such as acute nursing. The authors pointed out that continuing education in practice will need to bridge the context of disaster nursing in undergraduate courses so that the consistency and continuity of education may be maintained.
Yoshida (2005) ¹⁵	Questionnaire distributed to 84 universities in Japan (2000)	Sixty-nine replies were analyzed with disaster-nursing topics being provided by 13% of these universities.
Yamamoto et al (2005) ¹⁹	Nineteen Red Cross nursing schools, including Red Cross universities, were investigated. A literature review and group discussion were conducted for the purpose of curriculum development.	The seven categories used to construct the teaching context were: disaster theory; preparedness for disaster; nursing at disaster situation; protection of health care worker in disaster situation; volunteerism and nursing; ethical issues in disaster nursing; international cooperation.

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Table 5. Summary of articles with the theme “discipline and curriculum development”

studies varied and included report analysis, semi-structured interviews, and questionnaires. Four of six articles in this category were on course evaluation. The studies included students’ reflections on learning from participation in disaster drills,⁹⁻¹² as well as their role

in the simulated disaster situations.^{13,14} All six of the articles in this category reported on the student involvement in drills (some studies with the health professional working in both hospitals and community) and the effectiveness of participating in these drills.

Study citation	Methods	Key Findings
Hirano (2002) ²⁰	Questionnaire to 62 nursing students	The students wanting to be relief/disaster nurses showed a high degree of sympathy, aid, ethical consciousness and social attitude in comparison to the students not wanting to be relief/ disaster nurses.

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Table 6. Summary of articles with the theme “attitudes of disaster relief nurses”

Discipline and Curriculum Development

Four articles were retrieved that focused on discipline and curriculum development (Table 5) with two of these articles reporting on the availability of a disaster nursing topic in Japanese university curricula. Yoshida reported that 13% of the nursing undergraduate programs provided disaster nursing topics.¹⁵ Matsumoto et al also surveyed the availability of disaster nursing topics in nursing undergraduate programs with 15 of 61 schools replying that they provided these courses.²² Yamamoto et al also surveyed 39 Red Cross nursing schools in Japan to explore the disaster nursing course context.¹⁹ They summarized seven areas in the context of disaster nursing education: (1) disaster theory; (2) preparedness for disaster; (3) nursing in disaster situations; (4) protection of healthcare workers in disaster situations; (5) volunteerism and nursing; (6) ethical issues in disaster nursing; and (7) international cooperation.

Only one article focused on the development of the discipline of disaster nursing.¹⁸ All other articles focused on the availability of disaster nursing in Japan, and did not address the context of discipline development.

Attributes of Disaster Relief Nurses

Only one article directly addressed the attributes of the disaster relief nurse (Table 6). Hirano surveyed 62 nursing students to investigate their attributes and made comparisons between those who were not interested in being relief nurses and those who were.²⁰ The results showed that there is a significant difference between these two groups, with the attributes of disaster relief nurses being those of commitment, devotion, and willingness to participate in disaster relief activities.

Discussion

Developing Research Methodology in Disaster Nursing Education

Yamamoto et al pointed out that there was an urgent need for a theoretical framework development for disaster nursing; however, no article discussing a methodology or theoretical framework of disaster nursing was found in this review.¹⁹ This could be due to the nature of disaster in that it cannot be predicted when a disaster will happen, and health professionals need to concentrate on relief activities during a disaster without taking time to conduct research.⁴ Therefore, there has been an emphasis on increasing preparedness in the case of disaster situations. If a theoretical framework is well-developed, researchers can explore further this area of study depending on the stage of disaster cycles and the needs of patients. It is necessary to develop a theoretical framework in disaster nursing; however, it is also important to focus on the stories of victims of disasters and those of responders, because these stories could also point out needs in disaster nursing research.⁴ Hence, a focus on both the individual and the organization is essential.

In this review, the majority of studies at institutional settings focused on pre- and post-training changes when assessing the present status of preparedness. This was due to the focus of this

review on disaster nursing education, and to the fact that the qualitative method was employed more frequently to evaluate the effectiveness of the programs, sessions, and training. Disaster nursing involves various life stages (pediatric, adult, and geriatric) and areas of study (including mental health). Expertise in these areas is required to further investigate the disaster nursing context. If the disaster nursing theoretical framework is defined, the deficient areas of disaster nursing research can be further highlighted. Due to the various life stages and areas of study, the disciplinary area of disaster nursing seems to be scattered, and needs to be categorized into areas of study. This categorization would make disaster nursing research more comprehensive.

Measuring preparedness in disaster nursing is an important concept, and requires continuity in training and awareness. However, none of the studies reviewed undertook a longitudinal perspective. Preparedness is an index that can indicate deficiencies in terms of resources, knowledge, and education. This area needs further investigation during the development of a disaster nursing theoretical framework, with various situations and scenarios applied to the framework. Research methodology in disaster nursing can also be developed by sharing the experiences of nurses and the communities from past disasters to enhance the effectiveness of programs and sessions. This allows for drawing upon what was learned from being involved in actual experiences. While the theoretical framework for disaster nursing is clarified, a methodological approach also needs development.

Disaster Nursing Topics in Curricula

Drills and training were considered to be an important part of the curriculum in nursing education. Due to curriculum revision in 2009, nursing schools in Japan are required to implement disaster nursing topics. Disaster nursing content is also included the national nursing registration examination that is required to sit for the exam to be qualified as a registered nurse in Japan. This revision will influence the disaster nursing content in nursing schools in the future. Investigating and documenting changes after the 2009 nursing curriculum revision is a potential topic for future research.

The Red Cross has a long history of contributing to disaster relief in Japan, and any school funded by the organization is expected to adopt the Red Cross philosophy that promotes first aid in communities. Therefore, implementation of topics relevant to disaster nursing is occurring naturally. The content of the topics vary, and it is assumed that this is related to the particular school's geographical location. For example, one school includes snow as a natural disaster hazard because it often has heavy snow fall around the school. As schools and universities embed the Red Cross philosophy into their curricula, the continuity of education through professional development is essential.¹⁸ Exposure to disaster training and education in earlier stages of professional education is beneficial. For example, one study found that nursing student participation in drills at a hospital worked in a positive way for both nurses and nursing students.¹ This finding

dispelled the notion that nursing students are not yet ready to work in an emergency triage system that requires quick decision-making within both clinical and ethical aspects. The study gave an indication of the effectiveness of triage training for nursing students, and is a potential topic for future research. Achieving positive outcomes and a communal understanding of the drills between health professionals and nursing students is necessary.

There are three venues where buffering capacity can be developed: in the work environment, in the educational setting, and in the community. The articles involving communities (Table 5) focus on how nurses should be involved in communities to protect them from disaster. This may be influenced by the professional roles of nurses and public health nurses in Japan. Mizushima et al reported that the role of the public health nurse during flooding of a regional area was significant, providing long term and community-based health support.¹⁶ Although the differences in the focus on nursing are pointed out, a greater focus on community involvement is needed. This paper focused on nursing education articles. A further focus on maintaining continuing education is essential, since health professionals need to utilize their ongoing knowledge and skills in practice.¹⁷

Characteristics of Japanese Disaster Nursing Education Studies

Japan experiences frequent disasters, and it could be said that the Japanese disaster health area of study has developed with need. Yamamoto developed a project to establish a network in disaster nursing to encourage the establishment of disaster nursing research, as well as education.¹ Demand for disaster nursing education is

high, not only within Japanese nursing educational institutions, but throughout Asia. A survey study by Miura et al showed that 44 out of 51 schools in the Asian region offer disaster education.¹⁸

An increase in the number of articles published also reinforces the importance of disaster nursing education. This may be related to the influence of the Red Cross, as some of the authors for papers found in this review have educational backgrounds with Red Cross nursing schools and universities. However, health professionals including nurses in the hospital setting, long-term institutional settings, and communities are also part of disaster nursing. Therefore, focusing on the various aspects for preparing for disasters requires inclusive development.

Conclusion

This study summarizes current research trends and issues for disaster nursing in Japan. Evaluation was frequently the primary objective of studies. This literature search showed that a wide variety of disaster nursing studies came to the conclusion that research influences practice. Disasters affect not only the institutional setting within an acute hospital locale but also affects people in communities, with the nurses roles expected to expand to the area of disaster nursing. The Japanese nursing curriculum revision in 2009 will influence disaster nursing education, and it is expected that there will be a variety of future studies. Education in disaster nursing is an important hub to build up the capacity in the community. Further development in this area of study is expected to explore evidence-based methodology including the theoretical framework for disaster nursing.

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