

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/227888086>

Chinese nurses' experience in the Wenchuan earthquake relief

Article in *International Nursing Review* · June 2010

DOI: 10.1111/j.1466-7657.2009.00795.x

CITATIONS

40

READS

120

5 authors, including:



Yanni Yang

Third Military Medical University

4 PUBLICATIONS 47 CITATIONS

SEE PROFILE



Lily Dongxia Xiao

Flinders University

47 PUBLICATIONS 299 CITATIONS

SEE PROFILE



Paul Arbon

Flinders University

124 PUBLICATIONS 1,250 CITATIONS

SEE PROFILE

Some of the authors of this publication are also working on these related projects:



Patient Presentations at Outdoor Music Festivals [View project](#)



Schoolies [View project](#)

All content following this page was uploaded by [Lily Dongxia Xiao](#) on 05 September 2017.

The user has requested enhancement of the downloaded file.

Chinese nurses' experience in the Wenchuan earthquake relief

Y.-N. Yang¹ RN, BSc, MNg, L.D. Xiao² RN, MNg, PhD, H.-Y. Cheng³ RN, BSc, J.-C. Zhu⁴ RN, BSc & P. Arbon⁵ RN, BSc, Med, PhD

¹ Associate Professor; ³ Associate professor; ⁴ Dean of School and Professor of Nursing, School of Nursing, Third Military Medical University, Chongqing, China, ² Lecturer in Nursing, ⁵ Dean of School and Professor of Nursing (Population Health), School of Nursing and Midwifery, Flinders University, Adelaide, South Australia, Australia

YANG Y.-N., XIAO L.D., CHENG H.-Y., ZHU J.-C. & ARBON P. (2010) Chinese nurses' experience in the Wenchuan earthquake relief. *International Nursing Review* 57, 217–223

Aim: The purpose of this qualitative study is to provide an understanding of how Chinese nurses acted in response to the 2008 Wenchuan earthquake.

Background: The literature has reported that Chinese nurses played a key role in the Wenchuan earthquake. Although these nurses' intentions were well meaning, and they made enormous efforts to save lives, they considered that disaster relief practice was beyond the scope of normal daily nursing practice and found the challenges they confronted overwhelming. China is a country prone to both natural and man-made disasters that demand a good deal of preparedness for those involved in disaster nursing. However, few studies have been conducted to investigate the knowledge, skill, experience and attitudes required for nurses responding to disasters.

Methods: Gadamer's philosophical hermeneutics was used as a framework to underpin and interpret the qualitative accounts of the practice of the ten registered nurses in this study.

Findings: Three themes were identified from semi-structured interviews with the participants. These are described as (1) feeling under-prepared; (2) perceived challenges and coping strategies; and (3) the rediscovery of the helping and caring role. By analysing these nurses' experiences in the Wenchuan earthquake relief operation, this study has identified the numerous roles and attributes required of nurses in response to disasters.

Conclusion: Without education and training in disaster nursing, nurses may not be prepared to function in disaster relief, especially in a manner that is productive, efficient, collaborative and less stressful. Findings suggest that a systematic, educational approach to develop the skills required in disaster nursing is essential.

Keywords: China, Disaster Nursing, Earthquake, Hermeneutics

Background

The World Health Organization (WHO) defines disaster as a situation where the normal means of support and dignity for

Correspondence addresses: Dr Lily Dongxia Xiao, School of Nursing and Midwifery, Flinders University, GPO Box 2100, Adelaide, SA 5001, Australia; Tel: +618-82013419; Fax: +618-82761602; E-mail: lily.xiao@flinders.edu.au. Professor Jing-ci Zhu, School of Nursing, Third Military Medical University, Chongqing 400038, China. Tel: +86-23-68752361; Fax: +86-23-68752361; E-mail: zhujingci@163.com.

people have failed as a result of natural or man-made catastrophe (WHO 2002). Disasters have always presented immense challenges to health-care systems. Nursing professionals comprise the largest group of health-care workers and will therefore play a key role in any major disaster relief. A well-prepared nursing workforce augments disaster response capacity and contributes to community resilience. However, before the '9-11' terrorist attack in 2001, disaster nursing education had not been at all well established in developed countries (Littleton-Kearney &



Slepski 2008). Disaster nursing in developing countries faces even *greater* difficulties, due mainly to their less well-developed health-care systems, fewer resources and their usually poor equipment and infrastructure. This paper, by reporting a study on nurses' experiences in responding to the Wenchuan earthquake in China, aims to enrich an understanding of the issues concerning preparedness for disaster nursing in a developing country.

On 12 May 2008 at 14:28:01 h Beijing time, a devastating earthquake, measuring 8.0 on the Richter scale, struck the Wenchuan region of Sichuan province. Based on the post-event report of the United Nations (UN), by 10 July 2008 'the death toll had reached 69 197 with 374 176 injured and 18 377 missing' (UN in China 2008, p. 4). Ten provinces and regions across the country were affected in some way, with more than 6.5 million houses destroyed and 15 million people having been evacuated from their houses. In the earthquake epicentre, consisting of Yingxiu county, Wenchuan county and Li county, the number of casualties was considerably higher than any of those of the other counties involved in the earthquake. In addition, the road system along with the water and electricity supplies had been cut off or destroyed, thereby paralyzing both communication and medical services.

Medical rescue teams were immediately organized by major hospitals across the country and deployed to the affected areas (UN in China 2008). The medical rescue teams were mainly made up of doctors and nurses, along with epidemic-prevention and support personnel. The literature has reported that this first-wave nursing response played a critical role in on-site rescue (Niu et al. 2008; Wang et al. 2008; Yang et al. 2008). These nurses had voluntarily participated in the disaster relief operation and demonstrated compassion, commitment to their duty of care, and displayed a great deal of solidarity to the affected community. Although these nurses were highly regarded as experts in trauma, wound care and infection control, they still considered their practice in the field of disaster to be beyond the scope of their normal nursing practice, which was in surgical, internal medical wards and operation theatres, thus providing an enormous challenge to their earlier perception of what it would be like to work in disaster conditions.

The International Council of Nurses (ICN) and International Nursing Coalition for Mass Casualty Education (INCMCE) strongly suggest that registered nurses (RNs) be equipped with the basic knowledge and skills to cope with massive casualty incident (MCI) regardless of experience and specialty (ICN 2009; INCMCE 2003). In the USA, core competencies in dealing with MCI, comprising critical thinking, assessment, technical skills and communication, have been incorporated into many curricula for entry-level RN education programmes. This model

sets the preparedness for disaster relief at a grass roots level and acknowledges the generalist knowledge and skills to be applied in disaster nursing practice across all care settings.

Preparing nurses for specialized practice in disaster nursing is strongly recommended, with the INCMCE identifying 15 expanded roles at the advanced practice level (INCMCE 2003; Stanley 2005). This approach espouses the specialist knowledge and skills underpinning disaster nursing. There is a variety of educational programmes at this level, ranging from short, continuing nursing education courses to graduate courses (Jennings-Sanders & Frisch 2005; Littleton-Kearney & Slepski 2008). Nurses with perioperative care, community health and public health backgrounds are most likely to be the first responders in MCI and should be targeted for disaster nursing specialty programmes (Ireland et al. 2006; Williams et al. 2008).

Of the 137 major disasters recorded in 2008, China was hit by 29 of those assessed as being 'the worst' (Rodriguez et al. 2009). All countries suffered severe loss of life and economic damage costs, with China experiencing the most severe losses (Rodriguez et al. 2009). However, despite China's susceptibility to disaster, prior to the Wenchuan earthquake, there was absolutely no disaster nursing content in undergraduate programmes, nor was there a standard training course for post-RNs (Zhang 2009). Few studies have been conducted to examine how nurses work in the field of disaster relief. It is therefore anticipated that this study will inform education and practice in disaster relief for nurses in China by gaining insights into a group of nurses' self-described practices in the on-site rescue during the devastating Wenchuan earthquake relief.

Methods

Aims

The purpose of this qualitative study was to enrich our understanding of how Chinese nurses experienced their practice during the on-site response to the Wenchuan earthquake. Two research questions guided the study:

- 1 What were the experiences of the rescue nurses who engaged in on-site rescue in the Wenchuan earthquake relief?
- 2 What enablers and barriers did the rescue nurses perceive during the Wenchuan earthquake relief?

Methodology

Gadamer's philosophical hermeneutics was used to interpret these nurses' self-described practice in the on-site Wenchuan earthquake relief. Gadamer believes that human action or experience is similar to a 'text' for the investigator to interpret (Gadamer 1989). The meaning from the interpretation of the 'text' is a fusion of what the 'actor' says and what it means to the

interpreter in a social–historical context. This philosophic tradition acknowledges the interpreter's 'prejudice' about the particular phenomenon under study and the influence of a social–historical context throughout the interpretive processes, or hermeneutical circles. In this study, the methodology enables the researchers, who were nurse educators in two universities across China and Australia, to discover the knowledge, skills, attitudes and issues concerning disaster nursing preparedness.

Participants and setting

A purposive sample of ten RNs who participated in the on-site earthquake rescue was selected. All participants were staff members from three tertiary teaching hospitals affiliated with a university in Chongqing, China. They were all female and aged between 30 years and 43 years. The majority of them were married with children. None of them had any formal disaster nursing training but came from emergency and perioperative care backgrounds in an acute care hospital setting.

They voluntarily joined rescue teams and were deployed to the most affected areas, which were Yingxiu county, Wenchuan county and Li county. The duration of their time in the field hospitals ranged from 16 days to 55 days.

Data collection and analysis

The study received ethical approval from the Third Military Medical University in China. Potential participants were invited to take part in interviews via means of a letter of invitation. People who responded to the invitation were contacted to make arrangements for the interview. Informed consent was obtained before the interview. Guarantees of confidentiality, the freedom of refusal to participate or to withdraw from participation, and the freedom to refuse to discuss particular questions were ensured. Interviews were taken 3–4 months after the on-site rescue. Although all participants received psychological counselling during and after the on-site relief, and once they returned to normal work in the hospitals, special care was taken to minimize any psychological trauma. For example, we offered breaks and psychological counselling support for participants once they had been identified (after interviews) as being traumatized.

Data were collected by face-to-face in-depth interviews with the ten nurses. In addition, reports and field diaries written by these nurses were collected for analysis. A semi-structured interview guide was used in the in-depth interviews (see Table S1), and interviews lasted between about 1 h and 2 h. Interviews were tape-recorded and transcribed verbatim. The first author listened to the voice data and translated them. Participants were given opportunities to check transcripts from their interview and to modify their data if required. Data were circulated to the research team members for thematic analysis, with some partici-

pants being invited to clarify findings from these in-depth interviews during the data analysis period.

Findings

Three themes were identified and are described as (1) feeling under-prepared; (2) perceived challenges and coping strategies; and (3) rediscovering the helping and caring role. Selected excerpts of interviews are used to support the discussion of findings.

Feeling under-prepared

Although all participants volunteered to participate in the earthquake relief, none of them had prior experience in disaster training or disaster relief. They felt that they were on a journey to an unknown area of practice and they questioned their abilities to undertake such a task. As one participant stated:

The road was totally destroyed and we had to walk more than 9 hours to Yinxiu, carrying a 30 kg backpack. We had to give up equipment we'd prepared, including the mobile operating theatre. It is quite physically demanding. . . . On the way to Yinxiu, we witnessed tragic life losses and brutal damages. I had a strong feeling that I was incompetent for this task. . . . Be honest, when rocks fell during the aftershocks, I had a fear of dying in the scene.

Besides the feeling of mental and physical under-preparedness, participants further identified a lack of knowledge and experience in on-site rescue, as one participant described:

Our rescue team was the earliest arrival and we found Yinxiu town totally destroyed. There was no running water, no electricity and no local medical services. We were soon surrounded by a large crowd who were desperately seeking medical assistance. Although we knew our first priority was triage, we recognized that the method we used in the hospital did not work there when confronting the large numbers of casualties. . . . We had to make a great effort to maintain order while undertaking triage.

Previous experience in a hospital setting did not guarantee productive work in disaster conditions. The specialist knowledge and skills required for nurses in these conditions include being a commander, leader and manager in an extremely chaotic situation.

The exceptionally high mortality significantly affected these rescue nurses' mental state, as one participant stated:

We saw and smelt corpses every day and witnessed large numbers of victims dying on arrival or soon after operations. I watched a girl die half-way through digging her out from the

building. Her small hand was in my hand and she talked to me . . . These horrible deaths always came to me at night and I could not sleep for a quite a long period after I returned from the rescue.

Although these participants acknowledged that they cared for dying patients and dealt with death in hospitals before the disaster relief, the extremely high mortality and the impact on every family in the disaster areas severely challenged their coping ability. According to their diaries, they lived with the dreadful experience for a considerable period of time after they had returned from the rescue task.

The strategies used to minimize psychological trauma were identified as being helpful, as two of participants discussed:

We received on-site psychological counseling services from professional counselors who joined our rescue team a few days later and worked side-by-side with us . . . They distributed information booklets that established how to cope with trauma situations. They also organized group discussions to help us identify and report early signs and symptoms of post-traumatic stress disorder.

We were offered a psychological support package after the on-site rescue. Services included a series of sessions of group discussions facilitated by professional counselors and a week's retreat where we had a quiet and relaxing time . . . We also had opportunities to meet other rescue workers with whom to share experiences in coping with the stress via therapeutic sessions.

Participants agreed that these strategies helped them to understand psychological trauma, to report post-traumatic stress disorder (PTSD) and to seek resources to help recover from the trauma. The ten participants believed that they now had experience in coping with traumatic situations, which would help them to support others in any future disaster relief.

Perceived challenges and coping strategies

Participants described the main challenge as being in an unfamiliar working environment, with scarce supplies and the vital need to learn how to adapt to the environment. As one participant stated:

Equipment and supplies for operating theatre in the tent were unavailable due to transport problems . . . We had to use whatever was available. We used mineral drinking water to clean instruments and iodine to disinfect the instruments instead of high-pressure sterilization. I still question myself if the practice was right, although it saved lives in that situation.

Their experience did raise issues concerning modification of practice and standards in extreme disaster conditions. They experienced ethical dilemmas with regard to their decision making.

However, *saving the lives of the victims* tended to underpin their decisions.

Making decisions on the appropriate course of action was an important issue for disaster nurses working in unfamiliar situations, as described below by two of the participants:

We identified large numbers of victims with urinary retention. The urinary catheters we brought in were insufficient, so we cut the tube from intravenous infusion sets and fired the ends slightly. . . .

I knew we must have knowledge and skills to treat patients with gas gangrene. I had not had experience in this area so I reviewed relevant documents a few hours before departure. I even brought a photocopy of the documents to the field and set a standard to guide our practice.

Their experience reinforced that these disaster nurses had to work without depending on an adequate supply of equipment and consumables. In such conditions, they totally relied on assessment skills, clinical judgement and specialist knowledge about injuries and infections in the disaster field. They had to be flexible, use initiative and be creative when routine practice was not possible.

All participants described having to play multiple roles in the on-site rescue that were totally out of their experience in a hospital setting. They learned how to adapt to these roles, as another participant points out:

We noticed many rescue workers (non-medical rescue workers) had a fever and diarrhea and we began to plan and implement infection control measures. We educated all rescue workers to use whatever they could to protect them from direct contact from sources of infection, such as corpses. We also instructed them how to avoid consuming contaminated food and water.

Participants found that they adapted to an educator's role very well and believed that they regularly engaged in health education in the field. However, the role they described was not one that they usually carried out in a hospital setting. As another participant said:

As the local medical services were paralyzed, we took charge of medical supplies from different medical stations and negotiated with other rescue teams for sharing resources and supplies in the town . . . We could not gain any assistance from local healthcare professionals and we had to learn local knowledge about residents, water and food sources from our

patients and their relatives . . . We had to work as housekeepers and search for food, cook, and arrange accommodation for the entire rescue team.

Organizational and management skills were identified as important attributes for rescue nurses in such harsh conditions, where their practice was jeopardized owing to lack of supplies and services. Because of the interruption to transport, they were placed in a vulnerable position because of the shortage of basic needs for their daily living. Local knowledge was identified as an important component in their practice, but the inability to build a collaborative working party with local nurses because of an inability to communicate with them was a barrier to productive work.

Rediscovering the meaning of helping and caring

Although participants experienced many challenges, frustrations and distress, they admitted that the rescue work gave them opportunities to grow both professionally and personally, as one participant described:

When I observed patients at night in the field using torches and kneeling on the wet ground, I felt that I was the Lantern Goddess guarding the wounded. I recognized I was doing what Nightingale did in the field. I had not had this feeling of Nightingale spirit in a hospital setting . . . After the rescue experience I become less caring about personal gain and loss in the hospital. Caring for others makes me feel meaningful in my life.

In their diaries, they reflected on the life-changing nature of the event and concluded that the rescue experience was worthwhile, because they had developed a sense of self-value through their responses to these tremendous challenges. They recognized that witnessing great suffering and loss of life had helped them to value life and to help those in need through their nursing work.

The theme of helping and caring also related to caring and supporting *each other* among the rescue team members, as a participant stated:

Due to the interruption of telecommunications we lost contact with our families for quite a long period, and we even did not know if we could survive when we were threatened by aftershocks. We totally depended on the team support in such an uncertain period. We felt we became close and cared for each other.

The *team* was used as a mechanism to debrief and ease anxiety, and to survive in a situation with a lack of basic supplies. Caring and helping each other contributed to team building and effective teamwork in the field.

Discussion

Although these nurses were well intentioned and made enormous efforts in saving lives, the fact that they were inexperienced in disaster nursing may have impeded them from functioning in disaster relief in a way which is productive, efficient, collaborative *and* less stressful. After the Wenchuan earthquake, Zhang (2009) investigated 20 Chinese nursing colleges and found that only a few of the military universities had developed courses in the field of rescue – such as field military nursing, emergency and war wound nursing, with a focus on battlefield rescue. Most nursing colleges offered only an emergency nursing topic of 2–4 h duration with a very limited focus on disaster nursing.

A systematic approach to responding to disaster covers most care settings and geographic areas in a country (Ireland et al. 2006; Littleton-Kearney & Slepski 2008; Stanley 2005). A mandatory curriculum change in undergraduate and postgraduate programmes, and also through continuing nursing education programmes, has been applied for in the USA to address issues of preparedness for disaster nursing (Ireland et al. 2006; Weiner et al. 2005). Collaboration between nursing regulatory bodies and the education sector will play a key role in ensuring the success of the change. In addition, such preparedness has emphasis on community care nurses, who are expected to engage in disaster nursing across all stages (Jennings-Sanders & Frisch 2005).

It has been strongly argued that while health professionals working in rural hospitals and community care areas are expected to play a key role in disaster relief, generally, they are less prepared for such a role because of difficulties in gaining educational and resource support (Hale 2008; ICN 2009). In developing countries such as China, community care in rural and remote areas is still underdeveloped, although the majority of the poorest population live in these areas and *most* disasters tend to hit these areas (World Bank 2009). An educational preparation model to cover these underdeveloped localities is imperative. The Wenchuan earthquake's most affected areas were in rural and remote locales, mainly inhabited by ethnic groups including the Qiang, Tibetan and Hui people, who have specific cultures, traditions and languages. In the present study, if the rescue nurses could have worked side by side with local community nurses, the response may have been more effective, they may have had better access to supplies, and have been less stressed and more familiarized with regard to the patients under their care.

Preparing community care nurses for disaster relief augments community resilience in disaster situations. Through collaboration between the community nurses and outside rescuers, community preparedness and response to disasters, recovery from disaster and community development after disaster could all happen simultaneously (Jennings-Sanders & Frisch 2005). Unlike developed countries with a relatively equal distribution of

health-care resources, developing countries such as China still face enormous challenges to close the gaps in health care between rural and urban areas (World Bank 2005). Unequal learning opportunities, along with unequal distribution of learning resources for nurses, have been reported in literature in China (Xiao 2006). Nurses who work in rural areas need additional support through scholarship or via funding allocation for the preparedness of disaster nursing if the systematic educational approach is to be considered.

Studying disaster nurses' competencies helps the design of competency-based disaster education and training courses. The WHO and ICN have developed disaster nursing competencies for general nurses (Dorsey 2009; ICN 2009) that can determine competency-based outcomes. ICN also espouses specialist knowledge in disaster nursing as well as collaboration with other disciplines (ICN 2009; Minami 2007). In the present study, nursing activities in the on-site rescue covered aspects from direct patient care to logistical support. The participants did demonstrate flexibilities in utilizing general and specialist knowledge and skills, and even in managing their limited resources. Assessment skills and clinical judgement in perioperative care helped the rescue nurses to win time to save victims' lives.

Before the Wenchuan earthquake, there were few studies conducted to explore knowledge, skills and attitudes required for nurses responding to disaster relief in China. Although there are increasing numbers of publications in disaster nursing in China after the Wenchuan earthquake, most studies focus on reflecting on the working experience of on-site rescue (Niu et al. 2008; Yang et al. 2008). The lack of systematic studies in professional competencies for general nurses and nurses specialized in disaster nursing in China could impact on the development of disaster nursing. In addition, studies show that the use of simulation and drills can heighten a student's sense of the realism of the disaster nursing course and enhance the outcomes of learning (Littleton-Kearney & Slepski 2008; Wynd 2006). Therefore, incorporating scenarios from real situations into courses and programmes is a necessary part of teaching and learning innovation.

The perceived under-preparation for disaster response found in the present study reflects a similar concern apparent in the literature. In a study on Iranian nurses' responses in the Bam earthquake, the researchers found that respondents generally lacked knowledge and skills in disaster response (Nasrabad 2007; Nasrabad et al. 2007). Similar results were identified from a study conducted by Shih et al. (2002), which revealed that a factor preventing Taiwanese nurses' effectiveness during rescue operations in the 9-12 Taiwan earthquake might have been because of an absence of disaster training courses. These rescue nurses demonstrated a lack of prior understanding of the conditions in the disaster area and inaccurate assessment of the need for man-

power, medication and the essentials for daily living. Arbon et al. (2006) surveyed 3694 Australian nurses who had registered interest in responding to the Sumatra-Andaman earthquake and tsunami disaster relief in 2004 and found that only 7.8% claimed that they had previously worked in disaster response.

It has been reported that both disaster survivors and rescuers are susceptible to acute stress disorder (ASD) and PTSD (Hughes et al. 2007; Maher 2006; Mitchell et al. 2005). People suffering from ASD show sadness, anxiety, depression, fear and hopelessness, and suffer from insomnia and nightmares, and so forth from between 2 days to 4 weeks after the trauma. PTSD is diagnosed if these symptoms last more than 4 weeks. The incidence of ASD and PTSD is about 5-40%, with the more severe cases having a high rate of suicide (Maher 2006). Nearly every rescue nurse in the present study reported symptoms of ASD during the on-site rescue period, with a few reporting PTSD. The severity of casualties in the earthquake scenes, the interruption of communication with headquarters and a fear for their own safety during aftershocks all contributed to this high rate of ASD. This study suggests that on-site and post-relief counselling services are imperative to identify early-stage PTSD, as rescue nurses may not be aware of their own PTSD and therefore fail to seek support (Hughes et al. 2007; Minami 2007). Coping strategies for psychological reactions to tragic scenes in disasters should be incorporated into disaster nursing courses. Nurses should be knowledgeable about how to support disaster survivors *and* themselves in traumatic situations.

Conclusion

Through means of cooperative work with the ten nurses who participated in the Wenchuan earthquake relief, this study revealed several issues concerning preparedness for disaster nursing in a Chinese context. Based on the research findings, a systematic educational approach to respond to natural and man-made disaster is strongly suggested. This approach requires an incorporation of disaster courses and topics in undergraduate and postgraduate programmes, along with regular updating of disaster nursing through continuing nursing education. In a country that is prone to natural and man-made disasters, like China, every nurse should have basic knowledge of and skills in disaster relief. Nurses who are most likely to engage in disaster relief, such as those in perioperative care, emergency care, community care and public health, should be equipped with advance knowledge and skills in disaster relief.

Because of the use of qualitative study, findings from this study cannot be generalized but can be transferred to a similar context. In addition, this study only explored nurses' experience in on-site rescue; therefore, the knowledge, skills and attributes demanded for disaster nurses revealed in this study can only be

partial. As community recovery and development are equally important in disaster nursing, study of nurses' practice in these areas is also strongly recommended.

Author contributions

Y. Yang designed the research, collected and analysed the data, and developed the first draft of the paper; L. D. Xiao supervised this research, developed the study conception, analysed the data and made significant changes for the first draft of the paper. H. Cheng collected and analysed the data; J. Zhu supervised this research, and critically reviewed and revised the paper. P. Arbon critically reviewed and revised the paper.

References

- Arbon, P., et al. (2006) Australian nurses volunteering for the Sumatra-Andaman earthquake and Tsunami of 2004: a review of experience and analysis of data collected by the Tsunami Volunteer Hotline. *Australasian Emergency Nursing Journal*, **9** (4), 171–178.
- Dorsey, D.M. (2009) *WHO/ICN disaster nursing competencies, WHO and ICN*. Available at: http://www.icn.ch/congress2009/presentations/M23_DORSEY_HALL1A/index.html (accessed 10 October 2009).
- Gadamer, H.G. (1989) *Truth and Method*. The Crossroad Publishing Corporation, New York.
- Hale, J.F. (2008) Managing a disaster scene and multiple casualties before help arrives. *Critical Care Nursing Clinics of North America*, **20** (1), 91–102.
- Hughes, F., Grigg, M., Fritsch, K. & Calder, S. (2007) Psychosocial response in emergency situations: the nurse's role. *International Nursing Review*, **54** (1), 19–27.
- International Council of Nurses (ICN) (2009) *Fact sheet: disaster response*. International Council of Nurses. Available at: http://www.icn.ch/matters_disaster_response.htm (accessed 20 October 2009).
- International Nursing Coalition for Mass Casualty Education (INCMCE) (2003) *Educational competencies for registered nurses responding to mass casualty incidents*. Available at: <http://www.aacn.nche.edu/education/pdf/INCMCEcompetencies.pdf> (accessed 10 May 2009).
- Ireland, M., Emerson, E., Kontzamanis, E. & Michel, C. (2006) Integrating disaster preparedness into a community health nursing course: one school's experience. *Disaster Management & Response*, **4** (3), 72–76.
- Jennings-Sanders, A. & Frisch, N.W.S. (2005) Nursing students' perceptions about disaster nursing. *Disaster Management & Response*, **3** (3), 80–85.
- Littleton-Kearney, M.T. & Slepski, L.A. (2008) Directions for disaster nursing education in the United States. *Critical Care Nursing Clinics of North America*, **20** (1), 103–109.
- Maher, H.K. (2006) Posttraumatic stress disorder after the hurricanes. *AAOHN Journal*, **54** (11), 508.
- Minami, H. (2007) Guest editorial. *International Nursing Review*, **54** (1), 1–2.
- Mitchell, A., Sakraida, T. & Zalice, K. (2005) Disaster care: psychological considerations. *Nursing Clinics of North America*, **40** (3), 535–550.
- Nasrabad, A.N. (2007) INR authors speak out: improving nursing care following disasters. *International Nursing Review*, **54** (1), 10.
- Nasrabad, A.N., Naj, H., Mirzabeigi, G. & Dadbakhs, M. (2007) Earthquake relief: Iranian nurses' responses in Bam, 2003, and lessons learned. *International Nursing Review*, **54** (1), 13–18.
- Niu, X.X., Tan, Y.J. & Du, L. (2008) Reflection on on-site rescue of the Wenchuan earthquake. *Nursing Journal of Chinese People's Liberation Army*, **25** (7B), 9–10 (in Chinese).
- Rodriguez, J., Vos, F., Below, R. & Guha-Sapir, D. (2009) *Annual Disaster Statistical Review 2008*. Centre for Research on the Epidemiology of Disasters, Brussels, Belgium.
- Shih, F.J., et al. (2002) The impact of the 9-21 earthquake experiences of Taiwanese nurses as rescuers. *Social Science & Medicine*, **55** (4), 659–672.
- Stanley, J.M. (2005) Disaster competency development and integration in nursing education. *Nursing Clinics of North America*, **40** (3), 453–467.
- United Nations in China (UN in China) (2008) *UN China Appeal for Wenchuan Earthquake Early Recovery Support*. United Nations, Beijing.
- Wang, L., Wu, Y. & Li, Y.P. (2008) Nursing of the medical rescue for the wounded after severe earthquake. *Journal Regional Anatomy & Operative Surgery*, **17** (5), 338 (in Chinese).
- Weiner, E., et al. (2005) Emergency preparedness curriculum in nursing schools in the United States. *Nursing Education Perspectives*, **26** (6), 334–339.
- Williams, J., Nocera, M. & Casteel, C. (2008) The effectiveness of disaster training for health care workers: a systematic review. *Annals of Emergency Medicine*, **52** (3), 211–222.
- World Bank (2005) *Health Service Delivery in China: A Review*. World Bank, Washington, DC.
- World Bank (2009) *From Poor Areas to Poor People: China's Evolving Poverty Reduction Agenda. An Assessment of Poverty and Inequality in China*. World Bank, Beijing.
- World Health Organization (WHO) (2002) *Definitions*. Available at: <http://www.who.int/hac/about/definitions/en/print.html> (accessed 20 May 2009).
- Wynd, C.A. (2006) A proposed model for military disaster nursing. *Online Journal of Issues in Nursing*, **11** (3), 17.
- Xiao, L.D. (2006) Nurse educators' perceived challenges in mandatory continuing nursing education. *International Nursing Review*, **53** (3), 217–223.
- Yang, Y.J., Lu, G.D. & Xu, L.P. (2008) Reflection on experiences of nursing administration and management in Sichuan earthquake medical rescue. *Nursing Journal of Chinese People's Liberation Army*, **25** (6B), 3–4 (in Chinese).
- Zhang, Q. (2009) Analysis of the status quo of disaster nursing and enlightenment of nursing education toward disaster in China. *Chinese Nursing Research*, **23** (4A), 923–924 (in Chinese).

Supporting information

Additional Supporting Information may be found in the online version of this article:

Table S1 An interview guide

Please note: Wiley-Blackwell are not responsible for the content or functionality of any supporting materials supplied by the authors. Any queries (other than missing material) should be directed to the corresponding author for the article.