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(Degree)

博士 (保健学)

(Date of Degree)

2014-09-25

(Date of Publication)

2015-09-01

(Resource Type)

doctoral thesis

(Report Number)

甲第6245号

(URL)

<https://hdl.handle.net/20.500.14094/D1006245>

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Issues raised by nurses and midwives in a post-disaster Bantul community

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Abstract

Bantul in Central Java was the most severely damaged area by a devastating earthquake in May, 2006. Even after being victims themselves, nurses and midwives at public health centers worked devotedly. The present research aims to identify the nurses' and midwives' perceptions and understanding of their roles, as well as the needs of training in disaster preparedness and management.

Focus group discussions and questionnaire survey were conducted with 11 nurses and 11 midwives of public health centers in Bantul. Content analysis was applied to analyze transcripts of the focus group discussions and the responses to questionnaire.

Health care for survivors and community were provided by highly committed health professionals supported in strong community resilience. Donors driven relief programs tended to be unorganized and insensitive for local health providers. Besides, organized disaster management trainings are strongly needed to develop disaster nursing and preparedness.

Embedded problems of local health system and current nursing practice were highlighted. Focus group discussions provided vital information that can and must be used to improve disaster response capabilities. Moreover, it was equally crucial to examine carefully what unfolded during post-disaster intervention.

Introduction

Since the turn of the century, Indonesia has experienced many disasters. One such disaster was an earthquake that struck Bantul, a farming area and suburb of Yogyakarta city on May 26th 2006. The death toll was particularly high due mainly to the poorly constructed earthquake-resistant concrete and bricks houses that collapsed. Total deaths exceeded 6,500 people and the injured numbered more than 20,000. The most severely damaged sub-districts in the Bantul district were Pleret and Jetis. In Pleret, 11,195 houses were destroyed, 526 people died and 2,777 were severely injured. In Jetis, 8,190 houses were destroyed, 872 people died and 223 were severely injured (School of Nursing, 2008; United Nations Office for the Coordination of Humanitarian Affairs, 2006; Ministry of Health, 2006). As a result of the earthquake local health centers, called Puskesmas, and major government medical institutions in the area were severely damaged causing major disruption to health service.

Disaster management in Bantul

Disaster relief for the Bantul district swung into operation quickly as a result of disaster management experience gained following the Tsunami in Banda Ache and the earthquake in Nias (Leitmann, 2007). The relative ease of access to Yogyakarta, a major city in Indonesia, was one of major factors for Bantul receiving any relief services from outside. Immediately following the earthquake, medical relief teams were dispatched from Yogyakarta and other province hospitals to treat victims in temporary field clinics. In addition, many of the injured were transferred to hospitals and a temporary clinic was set up in a nursing school in Yogyakarta city. International relief organizations, such as the World Health Organization (WHO), United Nations Children's Fund (UNICEF), and countries including the United States and Japan rushed into the area following the disaster. The relief organizations provided health services and training for health volunteers in the villages that established Puskesmas in order to provide support for survivors. However, services for survivors that attended Puskesmas were not always well organized or coordinated. The lack of coordinated services meant that many relief organizations left the area, while survivors remained in temporary tents or damaged houses without any guarantee of further treatment (School of Nursing, 2008).

Local health system and Nursing license in Indonesia

In Indonesia the Puskesmas functions as primary health care institutions within the local health system (Shields and Hartati, 2006). It is located in every sub-district throughout the country, aiming for environmental and preventive health care to at least 30,000 people by each Puskesmas (Kristiansen and Santoso, 2006). In remote area like Bantul, Puskesmas plays the role a major medical service for local residents. Regular health services at Puskesmas in Bantul provide mainly out-patient services such as internal medicine, pediatrics, gynecology, and dental care. Severe cases are, where possible, transferred to regional hospitals or major hospitals in Yogyakarta. Supporting school health is a part of the local health service provided by Puskesmas as a school nursing system has not been integrated into the Indonesian education system. Nursing professionals from Puskesmas are required to conduct yearly health check-ups for students and to maintain health records.

In remote villages, Puskesmas staff are required to work with the village midwives and local community health workers, called 'cadres', to promote primary health care for the residents. Village midwives are primarily responsible for maternity and health needs of children as well as providing maternity and infant check-ups. Cadres are locally based volunteer health workers assigned by their community committee to help village midwives or Puskesmas nurses to provide immunization, infant checks, and maternity check-ups in their community (Ministry of Health, 2010; Ronsmans et al., 2009). International Council of Nurses pointed out the necessity of development of continuing education programmes and in-service education in disaster nursing framework competency (WHO/ICN, 2009). However, on the job trainings for health professionals at Puskesmas not regulated by local government. Nursing staff need to pay themselves for trainings at considerably high cost, almost equivalent to their one month salary. Therefore, many of them gave up taking further trainings unless free trainings were offered by chance.

The Indonesian nursing license system is currently undergoing a change from high-school level education to university level education. The majority of nurses and midwives in Puskesmas have high-school level educational backgrounds (Shields and Hartati, 2003). The educational system to upgrade their license has yet to be fully implemented. Professionals at Puskesmas include nurses, midwives, and dental nurses who graduated from specialized

schools according to their field of expertise (Ministry of Health, 2006). Village midwife education had operated to support health services in small villages in remote areas as a "sub-health post" system in the government's primary health care system. Village midwife education programs have now been suspended, however the village midwives license allows midwives to work as outreach health providers 'supervised' by the local Puskesmas (Ministry of Health, 2007; Ensor et al., 2009).

Literature Review

Following a disaster, many outside relief organizations rush to the devastated region to provide acute intervention according to their own strategies and then leave once their mission is completed. Reports by these organizations often focus on the problems of poor coordination of local institutions and highlight their efforts and achievements during relief activities (USAID, 2006; Cabinet office, 2007; Ministry of Health, 2006, 2007, 2010; Red Cross and Red Crescent, 2010). Following the Bantul disaster, large-scale devastating disasters keep occurring, such as hurricanes Gustve and Ike in 2008, the Padang earthquake in 2009, the Haiti earthquakes in 2010, and the Tohoku earthquake and tsunami in 2011. Many reported on challenges of disaster management, needs of disaster preparedness and efforts of relief organizations and government policy, but very few reported on the activities of local health providers as front-line staffs supporting and assisting survivors (Fuady et al, 2011; Sloand et al., 2012; Haar et al., 2012; Tanichi et al., 2012; Fuse and Yokota, 2012; Alder-Collins, 2013).

Lack of disaster preparedness of nursing professionals is argued even in advanced countries, where organized training system is available (Ranse and Lenson, 2012; Richardson et al., 2013). Many researchers have highlighted the need for training of local health providers to meet various health needs in post-disaster situations (Yang et al., 2010; Fuady, 2011; Husna et al., 2011; Hammad et al., 2012; Al Khalaileh et al., 2012; Filmar and Ranse, 2013). Although efforts to provide trainings, such as emergency treatment skills, have been made (Bistaraki et al., 2011; Gulzar et al., 2012; Charlton et al., 2011; Conlon and Wiechula, 2011), the effectiveness of training to meet the needs of front-line health providers are inconclusive (Williams et al., 2008; Husna et al., 2011). Heywood and Choi (2010) and Heywood et al. (2011) tracked recent changes of human resource for health in Java Island, where Bantul locates, and critically argued insufficiency of

human resource development in the health system. Furthermore, nursing professionals have been found to provide not only clinical care, but also psychosocial care to local residents (Sundram et al., 2008; Jose, 2010; Murray, 2010; Yamazaki et al., 2011; Ranse and Lenson, 2012), even though their own health problems, such as Posttraumatic stress disorder were not well supported by their institutions (Vane and Hull, 2008; Migl and Powel, 2010; Baack and Alfred, 2013; Zhen et al., 2012).

The scarcity of study about disaster responders in front-line has been pointed out (Stangeland, 2010; Baack, and Alfred, 2013), and the need for more focused research is argued by several reports (Chapman and Arbon, 2008; Williams et al., 2008; Giarratano et al, 2013). As ICN recommended the Framework of Disaster Nursing Competencies, disaster nursing research is needed for evidence based decisions and better understanding of the impact and long-term effects of disasters (WHO/ICN,2009), and the need for more focused research is argued by several reports (Chapman and Arbon, 2008;Williams et al., 2008; Yang et al.,2010).

This article focused on the feedback of nurses and midwives following their participation in the Bantul disaster relief efforts. We report on their involvement as front line responders and the needs for post-disaster nursing. In doing this we anticipate it will improve post- disaster healthcare while creating a greater awareness of the much needed and valuable role played by nurses involved in post disaster relief activities.

Aim

This research aims to identify the nurses' and midwives' perceptions and understanding of their roles, as well as the needs of educational programs and training in disaster preparedness and management for health care providers.

Methods

Research design

A qualitative research design was used for the focus group interviews in Bantul. Questionnaires were distributed to collect the demographic data and the responses to open-end questions. It was anticipated t h a t some nurses

might have been afraid to speak out in the focus groups discussions. Consequently questions used during the focus group discussions were also placed as the open-ended questions in the questionnaire. Questionnaires were distributed before the focus group discussions and collected after the discussions. The focus group discussions lasted 1.5 to 2 hours, were tape-recorded, and field notes were taken. The interviews were transcribed with the transcripts and open-end question responses were translated from Indonesian to English by the Indonesian authors and Indonesian English translators.

Data analysis

Content analysis was used to analyze the transcriptions from the focus group discussion and the responses to the open-end-questions in the questionnaire. Content analysis provides new insights and increases a researcher's understanding of particular phenomena and informs practical actions (Krippendorff, 2004). The information from the interview transcripts and the questionnaires was also used to identify the perceptions and needs of nurses and midwives. The transcriptions of focus group discussions were thoroughly read line-by-line by the researchers and labeled with codes. Codes with similar meanings were grouped into categories. The transcripts were reviewed in order to validate the code and categories (Graneheim and Lundman, 2004). The analysis was finalized by identifying four general themes.

Participants and data collection

Participants for the focus group discussions held at two health centers which were recruited from the two most seriously damaged areas of Bantul in March 2007, namely Jetis and Pleret. In Pleret, six nurses and four midwives participated while in Jetis five nurses and seven midwives participated in the focus group discussions. Two discussions were conducted separately at a nearby meeting hall of each Puskesmas. A total of 22 nursing professionals including 11 nurses and 11 midwives participated in the discussion. Their ages ranged from 34 to 60 years with their working experience spanning between 1.5 to 23 years (Table 1). Most participants had gained work experience at Puskesmas for more than seven years.

Table 1 Demographic data of Participants

22 nurses and midwives (nurses: 11, midwives: 11)

	<i>Pleret (N = 9)</i>	<i>Jetis (N = 13)</i>	<i>p-value</i>
Demographic data	(Mean ± SD years)	(Mean ± SD years)	
Age (years)	42.5 ± 8.4	40.9 ± 5.9	0.61
Working experience	19.4 ± 7.1	17.3 ± 4.4	0.41
Working experience at Puskesmas	17 ± 8.7	17.6 ± 7.7	0.86
License	(n=)	(n=)	
Nurse	5	6	
Midwife	4	7	
Last Education	(n=)	(n=)	
3 year diploma	4	5	
High school diploma	3	6	
Not answered	2	2	
Earthquake damages	(n=)	(n=)	
Family member s died in the disaster	2	0	
Property Damage			
Severe*	7	1	
Moderate	0	0	
Minor**	2	9	
Not answered	0	3	
PTSD related symptoms***	(n=)	(n=)	
Persistent re-experience of traumatic event	8	6	
Persistently making effort to avoid the stimuli associated with the earthquake	0	1	
Persistently experiencing symptoms that not present before the earthquake	3	4	
Way of disturbance by those experiences			
Impairment in social life	2	1	
Impairment in occupational life	0	1	

*Totally collapsed, Inhabitable

**Habitable

***Diagnostic criteria for 309.8 Posttraumatic Stress Disorder, DSM-IV

Ethical considerations

The study was approved by the Ethical committee of Gadjadara University, the Bantul district government and the respective health center's administration offices in Yogyakarta city. The participants were informed in writing and orally about the purpose and process of this research by the researchers. After agreeing to the conditions of the research, individuals signed the agreement papers.

Findings

A total of 255 codes were extracted from the focus group discussions and responses to the open ended questions. Codes were firstly grouped into 53 sub-categories, then into 16 categories. The four general themes as shown in Table 2 merged as perceptions and needs of nurses and midwives from the two centers in Bantul district.

Heavy roles of nurses and midwives

Burden as victims

All participants lived in the disaster area and experienced stress and fear about a possibility of reoccurrence of the disaster. Most did not have physical problems when we had the focus group discussions. However, several reported various mental health problems and one had a trauma-related problem (Table 1). All experienced stressful post-disaster events such as taking care of injured family members, managing daily living in destroyed homes and many were in grief of lost family members.

“When I feel a light stress, I cannot stop speaking loudly or screaming.”

“I feel guilty to my family that I cannot take care of them because I have to work at Puskesmas.”

Heavy work load

All participants returned to work within one week after the disaster. They felt overwhelmed by their workload and were required participate in over-time work. Most patients had traumatic emotional problems which were caused by the collapse of brick houses. Nurses were not only required to use their trauma care skills but had to assist and support physiotherapy for the follow-up of the injured patients. Despite insufficient medical supplies and equipment, nursing staffs had to take care of survivors who lined up for treatment in the small damaged Puskesmas. In areas where the transportation system was destroyed, nurses treated wounded neighbors at their own homes. During this stressful time many tetanus convulsion cases occurred due to the lack of tetanus immunization among adults.

Home and school visits, as well as taking care of drinking water including garbage disposable problems, increased significantly after the disaster. Some began to take care of neighbors immediately after the disaster. School visits

Table.2 List of themes and categories

Theme	Category	Sub-category
1. Heavy roles and disturbing working conditions	Burdens as victims	Own health problems
		Sacrifice of family care
		Drinking water problem
	Heavy work load	Overtime work
		Increase of trauma care and physiotherapy
		Increase of mental care
		Increase of tetanus cases
		Increase of home visits and school visits
		Too much manual documentation
	Interrupted health service	Closing dental and laboratory service
		Disturbed contraceptive service
		Medical supply Shortage
		Loss of clinical records
	Disturbing working condition	Hot, noisy and narrow clinic space
		No privacy for patients
Unorganized relief activities	Lack of information for nursing staff	
	Interruptive NGO activities	
	No training for donated ECG	
2. Difficulties and limitations in post disaster trainings	Inequity of opportunity	Less opportunities for junior staff
		Less general training opportunity for midwives
	Inappropriate training methods	Poor translation
		Poor qualification of trainer
		Lack of practical advice
		Too much intensity
		Hot, noisy training room
	Disorganized training environments	Inconvenient location
		Difficulty to participate after work
		Difficulty to participate in working time
3. Morale in post-disaster	Strong job commitment	Strong commitment for nursing profession
		Improvement in cooperation between nurses and midwives
		Good relationship with other staff
	Satisfaction and disaffection with job condition	Satisfaction with job condition
		Dissatisfaction with job condition
		Less recognitions for nurses than for midwives
		Lack of government recognition
	Overcoming stress with community resilience	Spiritual strength in faith
		Community recognitions for Puskesmas staff
		Support of family and friends
		Support for mental stress
4. Needs of disaster preparedness and nursing professional development	Needs of community disasterpreparedness	Needs of health education
		Developing disaster preparedness for future
	Needs of nursing accountability	Discontentment with doctor's helper position
		Lack of accountability for nurses
		Lack of support for village midwives
	Needs of disaster preparedness	Needs of education for community
		Disaster management training for future
	Needs of continuing trainings	Trauma care
		Emergency
		Disaster nursing
		Health education
		Mental care
	Needs of financial support for training	Physiotherapy
		Unaffordable training cost
	Needs of Computerization	Training allowance needs
Too much manual work for clinical records and survey		
No computer for nursing staffs		

were undertaken by nursing staffs to take care of students suffering from emotional and psychological problems including Post Traumatic Stress Disorder and to conduct a number of surveys as requested by government agencies.

Interrupted health services

Damage to buildings and the collapse of local government networks severely hampered the provision of health service at Puskesmas. Medical equipment, such as laboratory machines and dental equipment, was also damaged or destroyed, forcing the closure of these services. Also, the lack of much needed medical supplies hampered wound treatment and the availability of much needed medication.

The lack of computers created complex difficulties for health service providers resulting in difficulties maintaining clinical records and conducting post-disaster surveys. Most individual health records, including the data of school children, were lost in the disaster. This situation led to nurses collecting and maintaining data manually as computers were not available. Consequently nurses at the Puskesmas were overwhelmed by the amount of work they were required to perform.

Disturbing working conditions

All participants expressed concerns about being exhausted and found it difficult to provide health services in temporary clinics that were hot, narrow and noisy. Relief tents and bamboo-made shelters used as temporary Puskesmas buildings were easily affected by environmental conditions of heavy rain or hot weather which were typical of the tropical Indonesian climate. In addition, the noisy and non-private environment in the temporary buildings caused extreme embarrassment for patients receiving birth control treatment such as contraceptive implants.

Unorganized relief activities

Nurses and midwives were not adequately informed of the activities of relief medical operations in the area. The Indonesian authors worked with these Puskesmas and with the cooperation of local government to provide training for community health workers. In addition, the authors' university regularly sent medical teams to provide orthopedic and psychiatric treatment to

remote areas following the disaster. Very few of the nursing staffs were informed about these programs. In the emergency period, relief operations were conducted mainly by temporary medical teams from outside of Bantul while being coordinated by local government. This situation created serious concern for nurses as relief teams gave unknown medicines to local residents without adequate instruction, resulting in patients often taking their medication incorrectly.

Other times unsuitable medical equipments such as ECG machines were kindly donated. As no training in the use of the donated medical equipment was provided, doctors and nurses were unable to fully utilize all the equipment.

“I feel other relief organization ignore our health service at Puskesmas. “

“We could not work in the emergency period because we also were victims.

“But some NGO did not consider our situations and do their emergency operation by themselves. None of their activities reported to us.”

“We are donated ECG machine but nobody read the ECG at Puskesmas, even medical doctors. Why they do not provide trainings?”

Difficulties and limitations in post-disaster training sessions

All participants were grateful for being provided cost free disaster-related trainings. At the same time, difficulties and limitations in how training was offered was a constant source of concern for staff.

Inequity of opportunity

Previous training opportunities were given to senior staffs and the knowledge gained from the trainings had unfortunately only been disseminated among staff at Puskesmas. Junior staff members felt excluded from being considered as training candidates. Compared to nurses, midwives rarely had the opportunity to undergo general post-disaster trainings.

Despite this they were required to care for trauma cases in the same way as nurses in addition to their regular maternity responsibilities. Only maternity field training was provided after the disaster.

Inappropriate training methods

Training often lacked the necessary organizational structure required to provide quality training. Often difficulties arose with translation from a foreign language into Indonesian, leading to an incorrect interpretation of medical terms and confusion. Questions arose about the quality of lectures as some lecturers were not qualified in the topics of post-disaster recovery and management that they presented. Also, there were instances of topics being too crammed and not allowing adequate time for new knowledge and skills to be processed and practiced. Often sophisticated medical supplies used in training sessions were beyond the budget of local Puskesmas or simply unavailable for clinical use.

Disorganized training environments

Many concerns were expressed about the training locations and scheduled times. Training often took place after work in a local building that had barely survived the disaster and lacked air-conditioning. Other times, trainings were held in local meeting rooms which traditionally had no walls to shut out noise and heat from outside. Participants were often too exhausted and unable to concentrate on lectures in the disturbing environment.

Transportation was also a point of concern as participants were often required to fund travel using their own motor-bikes to attend training. This created financial hardship for many participants when training was held far from the Puskesmas. Sometimes participants failed to participate in the entire programs due to their busy clinic responsibilities.

Morale in Post-disaster

Strong Job commitment

Despite the difficulties faced by the nursing staff, morale remained relatively high during post-disaster health service activities. All staff were proud of their role as health professionals in providing services to the community, often under difficult circumstances. Importantly, high levels of morale contributed significantly to strong partnerships between nurses and midwives. Collectively they worked tirelessly taking care of patients suffering from the effects of the disaster. The staff felt a great deal of pride and satisfaction as the local community expressed appreciation and respect for them as health professionals at a time of immense pressures and many

challenges.

Satisfaction and disaffection with job condition

There is no doubt that given the extreme working condition following a disaster, many professionals face personal and professional challenges in unfamiliar working environments. This was the case for many health professionals following the disaster in Bantul. Many sacrificed their own needs, helping survivors despite losing family members and their homes. They worked around the clock in challenging and dangerous working conditions. This situation understandably created a sense of disappointment for some as they felt abandoned and let down by the government who failed to provide appropriate recognition for their extra ordinary sacrifices. Similar to many post disaster situations, nurses in particular felt they were not given the respect and credit that they rightly deserved for their post disaster activities. Nurses generally work together as a team. However, following the disaster, nurses found themselves working independently which requires a great deal of problem solving skills, decision making skills, creativity and independent thinking. This was not fully appreciated by other professional health workers who traditionally work independently and receive recognition for their contributions.

“Midwives work independently in health center, so we (nurses) felt that they were more respected than we were,”

“By the earthquake, many of us lost family members and we still have to work.”

Overcoming stress with community resilience

Many of the nursing staff emphasized how their cultural and traditional faith and family ties were very important factors in helping them to continue working and to overcome difficult situations that generated extreme stress. By sharing feelings and thoughts closely with families, friends and co-workers, they were able to face to this calamity and overcome this hardship together.

“This disaster is a challenge from God.”

“By faith, I can have spiritual support to overcome.”

“I can overcome this experience by being close to God.”

“Sharing my feelings with friends and co-workers, I feel better and I can face the reality,”

Needs of disaster preparedness and nursing professional development

Needs of community disaster preparedness

The participants emphasized the needs of health education for the community to prepare for future disasters. Cooperation of cadres was the key for them to promote disaster preparedness.

Needs of enhancing accountability as nursing professionals

Nurses expressed concern that aspects of their role, such as prescribing medicine when a doctor was not at Puskesmas, was inappropriate. Also, many felt that they were performing like doctor's assistants and not considered to be working independently like midwives do. This led some to believe they were not given the same level of respect or professional status that midwives, who work independently, receive as health professionals

It was clear from the feedback that village midwives working independently in the remote villages need good coordinated support and understanding of their difficult working environment and responsibilities from Puskesmas; however, they receive little support.

"Nurses were thought to be doctor's assistants in health centers."

"Midwives work independently in health center, so we (nurses) felt that they were more respected than we were,"

"We do not perform real nursing care at Puskesmas."

"Please pay more attention to village midwives. We must work for community almost 24 hours a day. We need more support. "

Need of disaster preparedness

All nurses and midwives perceived that disaster preparedness was needed both for community and nursing professionals. Most had regrets about never receiving disaster related training before the disaster. Had they received training they believe they could have worked more efficiently in the post disaster environment. All stressed the need for disaster training sessions by be provided regularly for Puskesmas health staff by suitably qualified professionals who have expertise in disaster preparedness, management and recovery. Ongoing training would allow staff to be prepared for any future disasters and allow them to provide necessary and appropriate quality care to survivors.

“Why we learn disaster nursing after the disaster?”

“We should have had these trainings before the earthquake had occurred. Then, we could have provided proper health service for the community.”

Need of continuing trainings

All participants felt a strong need for continuing trainings, in topics that included trauma counseling, grief counseling, Post Traumatic Stress Disorder management, emergency care, health education and ongoing disaster management. Additional support for village-midwives as previously mentioned was repeatedly emphasized in the transcription.

Need of financial and official support for training

The financial cost of trainings was the main reason preventing health professionals from participating in trainings before the disaster occurred. Training costs included sessions, transportation, lodging and food for individuals to participate when financial assistance was not provided. Self financing of trainings created a financial burden due to the salary levels for many participants who were afraid they would not be able to take further trainings for capacity development. Flexible working schedule arrangements were also needed to allow attendance at regular trainings.

Needs of computerization

Computers were only reserved for administrators. Consequently nursing staffs were required to manually process time consuming documentations. Findings from the data collected and analyzed clearly shows that nurses working at Puskesmas believe that by using computers to maintain records they would be better able to undertake their clinical responsibilities.

Discussion

Disaster relief workers often find themselves under extreme pressures, particularly during the emergency period, due to various factors including collapsed infrastructure, lack of equipment and supplies and disruption of communications (Hughes *et al.*, 2007). These factors often contribute to the disruption of well-meaning organizations and organizational structures. A

combination of these factors was experienced in Bantul, Indonesia following the earthquake (Schlehe, 2010; Macrae and Hodgkin, 2011; Kusumasari and Alam, 2012). Nurses and midwives were overwhelmed with the amount of workload, increased responsibilities and the various administrative demands related to ongoing post-disaster health care that was placed on their already stretched capabilities. Compounding problems was the expectation that disaster nursing skills could be developed by the hastily offered trainings under less than ideal organizational and environmental conditions.

Not only were severely damaged buildings utilized during trainings, they lacked air conditioning and privacy and endured disruptive noise. Lack of communication between outside providers and local health providers working in the disaster area, as well as indifference and lack of sensitivity to local knowledge caused confusion and added stress. Several researchers draw attention to these problems by stating relief programs tended to be offers-driven and burdensome (De Ville de Goyet 2008; Raharjo *et al.*, 2008; Macrae and Hodgkin, 2011).

As a result of this disaster, experienced nurses and midwives took the opportunity to evaluate their roles and responsibilities during their disaster relief efforts. It has emerged from focus group discussions and questionnaires that the role and responsibilities of nurses during the disaster period was relatively ambiguous which created confusion and a feeling that their efforts were not fully appreciated. Despite nurses taking on added responsibilities, they were not considered to have been working independently, though at times they felt they were working independently much like 'doctor's assistants.' On the other hand, midwives who specialized in maternity care traditionally work independently at the Puskesmas. Despite these differences nurses and midwives recognized that they, as nursing professionals, must work together in post-disaster health service beyond their routine work assignments. As Steiert (2007) suggested, cooperation between nurses and midwives should be strengthened to provide effective programs to promote disaster preparedness in their community (WHO, 2007). Despite this, Indonesian health centers remain unprepared for disasters. Fuady *et al.* (2011) reported 'determining the roles and responsibilities of nurses and midwives should be a priority to promote greater competence in nursing practice at Puskesmas.

During focus group discussions, both nurses and midwives expressed the need for ongoing disaster management training and to be consulted about topics that needed to be included during local training. This point of

discussion by the nurses and midwives is supported by Shields and Hartati (2003), Hennessy, Hicks, Hilan and Kawonal(2006a, c), Hennessy, Hicks and Koesno (2006b), and Hatt *et al.* (2007), who stated that the training and development needs of midwives varied in provinces, and the needs of community nurses are not well understood. It is crucial for disaster nursing trainings, as well as regular trainings, to build the capacity of health professionals (Archer and Seynaeve, 2007; WHO, 2007). The need for the development of disaster nursing at health centers did not escape the attention of the WHO, who reports that it is vital to promote disaster preparedness in local community (WHO, 2007).

Despite the many challenges faced by the nurses and midwives during the demanding disaster relief period, high morale and job commitment remained focused and strong among all participants. This can be attributed in part to the character of the Bantul communities' strong family bond, community network and religious spirituality. All contributed to the functions during the relief operation, compared to other areas such as Ache where community strength was not as prevalent (Ministry of Health, 2006; Raharjo *et al.*, 2008). Community residents who lost jobs and houses voluntarily supported relief operations and health providers endured the over-time work without the need for any added incentives. Collectively the community and its resilience supported the efforts of nurses and midwives.

Human development in local health providers is a key element to adapt training content effectively into daily practice (Khomeiran *et al.*, 2006); therefore the evaluation of trainings should be carefully examined. The experience of communities and front-line health providers could be integrated for further disaster interventions. As Claude reported in his study of 2007, preparing national volunteers prior to the event is the key for a future disaster (de Ville de Goyet, 2007). In Bantul villages, health education was given to residents mainly by cadres. There is a need for nurses and midwives from the local Puskesmas to provide ongoing disaster preparedness training, education and health promotion for the residents and cadres (Archer and Seynaeve, 2007; Achadi *et al.*, 2007). Local educational resources should be utilized more since Yogyakarta is well-known in Indonesia as a primary education center, which has many academic organizations, colleges and universities. Training policy for local health providers should be established by local government. Further, cooperation with local educational institutions should be promoted to have sustainable training system for Puskesmas in local communities.

Limitations of the Study

Script data in this study was translated from Indonesian to English. Therefore there is the possibility of subtle interpretation differences during translation of data from Indonesian to English. Also, as participants in this study were only available from the most devastated area, their numbers were small. The results of the study could not present the overall characteristics and concerns of nurses and midwives in Bantul community.

Conclusions

Focus group discussions provided vital information that can and must be used to improve disaster response capabilities. It is equally crucial to examine carefully what unfolded during post-disaster intervention. Focus must be on how local health providers perceived their activities and provided services in order to improve health service in the community and to promote disaster preparedness for future disaster. Furthermore, embedded problems in routine nursing practices and health care systems at local Puskesmas were highlighted and must be addressed in future research.

Nurses and midwives are the front-line health providers from the occurrence of the disaster to the later stages of post-disaster. Voices of the nurses and midwives in this study highlighted the embedded problems in health care system and current nursing performance at Puskesmas in Bantul. The on-the-job trainings are needed to enhance competency as nursing professionals to promote future disaster preparedness in community.

Disturbance of the health care environment along with unorganized disaster management is inevitable in any disaster. However, nursing, health care for survivors and community could be provided by highly committed health professionals trained in disaster management and preparedness. Establishing training policy and promoting cooperation with local educational institutions by government is crucial for capacity development of the health professionals.

Further study is needed to examine the activities and responsibilities of nursing professionals during post-disaster activities and to improve the standard of disaster nursing in Indonesia.

Acknowledgments

We deeply appreciate the cooperation of nurses and midwives who participated in this study, and the assistance of School of Nursing, Gadjadara University, to coordinate this study with local government. We also would like to thank to Dr. Glenn, a visiting professor of Kobe University, for his kind advice based on the abundant knowledge in disaster nursing.

References

- Achadi, E., Adisasmita, A., Deviany, P.E., Makowiecka, K., Marshall, T., Pambudi, E.S., Scott, S. and Ronsmans, C. (2007), "Midwifery provision and uptake of maternity care in Indonesia", *Tropical Medicine and International Health*, Vol.12 No.12, pp.1490-97
- Alder-Collins, J.K. (2013), "Courage and selflessness in professional actions: but are they enough?" *International Nursing Review*, Vol.60 No.2, pp.201-4.
- Al Khalaileh, M.A., Alasad, J.A. and Bond, E. (2012), "Jordanian nurses' perceptions of their preparedness for disaster management", *International Emergency Nursing*, Vol.20 No.1, pp.4-23
- Archer, F. and Seynaeve, G. (2007), "International standards and guidelines for education and training to reduce the consequences of events that may threaten the health status of a Community", *Prehospital and Disaster Medicine* Vol. 22 No.2, pp. 120–30
- Baack, S. and Alfred, D. (2013), "Nurses' preparedness and perceived competence in managing disasters", *Journal of Nursing Scholarship*, Vol.45 No.3, pp. 281-87, doi: 10.1111/jnu.12029
- Bistaraki, A., Galanis, P. and Waddington, K. (2011), "The effectiveness of a disaster training programme for healthcare workers in Greece." *International Nursing Review*, Vol.58 No.3, pp. 341-46, doi: 10.1111/j.1466-7657
- Cabinet Office (2007), *Assessment Report of Disaster Risk Reduction 2007*, available at: http://www.bousai.go.jp/kaigirep/hakusho/h19/BOUSAI_2007/html/index.htm, Government of Japan (accessed 10 September 2013)
- Chapman, K. and Arbon, P. (2008), "Are nurses ready?: Disaster preparedness in the acute setting Review", *Australasian Emergency Nursing Journal*, Vol.11, No.3, pp. 135-44
- Charlton, S., Fitzgerald, M. and Tamsin, J. (2011), "Emergency care in

- developing nations: The role of emergency nurses in Galle, Sri Lanka”, *Australasian Emergency Nursing Journal*, Vol.14, No. 2, pp. 69-74
- Conlon, L. and Wiechula, R. (2011), “Preparing nurses for future disasters—The Sichuan experience”, *Australasian Emergency Nursing Journal*, Vol.14, No.4, pp. 246-50
- De Ville de Goyet, C. (2007), “Health lessons learned from the recent earthquakes and Tsunami in Asia”, *Prehospital and Disaster Medicine*, Vol.22, No.1, pp. 15–21.
- De Ville de Goyet, C. (2008), “What should we learn from recent earthquakes in Asia?”, *Prehospital and Disaster Medicine*, Vol.23 No4, pp.305-7
- Ensor, T., Nadjib, M., Quayyum, Z. and Sucahya, P. (2009), “Level and determinants of incentives for village midwives in Indonesia”, *Health Policy and Planning* Vol.24, No.1, pp.26–35
- Filmar, B. and Ranse, J. (2013), “Who is my leader? A case study from a hospital disaster scenario in a less developed country”, *Australasian Emergency Nursing Journal*, Vol.16 No.4, pp.170-74
- Fuady, A., Mansyur M. and Trevino A.P. (2011), “Primary Health Center disaster preparedness after the earthquake in Padang Pariaman, West Sumatra, Indonesia”, *BMC Research Notes*, Vol.4, No.81, available at: <http://www.biomedcentral.com/1756-0500/4/81> (Accessed 15 January 2013)
- Fuse, A. and Yokota, H. (2012), “Lessons learned from the Japan earthquake and tsunami, 2011”, *Journal of Nippon Medical School*, Vol.79 No.4, pp.312-15.
- Giarratano, G., Barcelona-Demendoza, V., Harville, E.W. and Savage, J. (2013), “Disaster research: a nursing opportunity”, *Nursing Inquiry*. Jul 31. doi: 10.1111/nin.12049 . [Epub ahead of print]
- Graneheim, U.H. and Lundman, B. (2004), “Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness”, *Nurse Education Today*, Vol.24, No.2, pp.105–12.
- Gulzar, S.A., Faheem, Z.A. and Somani, R.K. (2012), “Role of community health nurse in earthquake affected areas”, *Journal of Pakistan Medical Association*, Vol.62 NO.10, pp.1083-86
- Haar, R.J., Acerra, J.R., Alagappan, K., Mathias, M. and Naderi, S. (2012), “The livelihoods of Haitian health-care providers after the January 2010 earthquake: a pilot study of the economic and quality-of-life impact of emergency relief”, *International Journal of Emergency Medicine*, Vol.5, No.13, available at:

- <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3327631/pdf/1865-1380-5-13.pdf> (accessed 31 August 2013)
- Hammad, K.S., Arbon, P., Gebbie, K. and Hutton, A. (2012), "Nursing in the emergency department(ED) during a disaster: a review of the current literature", *Australasian Emergency Nursing Journal*, Vol.15No.4, pp.235-44, doi: 10.1016/j.aenj.2012.10.005
- Hatt, L., Adisasmita A, Achadi, E., Makowiecka, K., Ronsmans, C. and Stanton, C. (2007), "Did the strategy of skilled attendance at birth reach the poor in Indonesia?", *Bulletin of the World Health Organization*, Vol.85, No.10, pp.774–82
- Hennessy, D., Hicks, C., Hilan, A. and Kawonal, Y. (2006a), "A methodology for assessing the professional development needs of nurses and midwives in Indonesia: paper 1 of 3", *Human Resource for Health*, Vol.4 No.8, doi: 10.1186/1478-4491-4-8, available at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1550419/pdf/1478-4491-4-8.pdf> (accessed 10 November 2009)
- Hennessy, D., Hicks, C. and Koesno, H. (2006b), "The training and development needs of midwives in Indonesia: paper 2 of 3", *Human Resource for Health*, Vol.4 No.9, doi: 10.1186/1478-4491-4-9 available at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1481611/pdf/1478-4491-4-9.pdf> (accessed 10 November 2013)
- Hennessy, D., Hicks D., Hilan, A. and Kawonal, Y. (2006c), "The training and development needs of nurses in Indonesia: paper 3 of 3", *Human Resource for Health*, Vol.4, No.10. doi:10.1186/1478-4491-4-10, available at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1524804/pdf/1478-4491-4-10.pdf> (accessed 10 November 2009)
- Heywood, P. and Choi, Y. (2010) "Health system performance at the district level in Indonesia after decentralization", *BMC International Health and Human Rights*, Vol.10 No.3, doi: 10.1186/1472-698X-10-3, available at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2839983/pdf/1472-698X-10-3.pdf> (accessed 10 November 2012)
- Heywood, P., Aryani, S. and Harahap, N.P. (2011), "Recent changes in human resources for health and health facilities at the district level in Indonesia: evidence from 3 districts in Java", *Human Resource for Health*, Vol.9, pp.5, doi: 10.1186/1478-4491-9-5, available at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3049179/pdf/1478-4491-9-5.pdf> (accessed 10 November 2012)

- Hughes, F., Calder, S., Fritsch, K. and Grigg, M. (2007) , “ Psychosocial response in emergency situations- the nurse’s role”, *International Nursing Review*, Vol.54, No.1, pp.19–27.
- Husna, C., Chaowalit, A. and Hatthakit, U. (2011), ‘Do knowledge and clinical experience have specific roles in perceived clinical skills for tsunami care among nurses in Banda Aceh, Indonesia?’ *Australasian Emergency Nursing Journal*, Vol.14 No.2, pp.95-102
- Jose, M.M. (2010), “Cultural, Ethical, and Spiritual Competencies of Health Care Providers Responding to a Catastrophic Event”, *Critical Care Nursing Clinics of North America*, Vol.22, No.4, pp.455-64
- Khomeiran, R.T., Ahmadi, F., Kiger, A.M. and Yekta, Z.P. (2006), “Professional competence: factors described by nurses as influencing their development”, *International Nursing Review*, Vol.53, pp.66–72.
- Krippendorff, K. (2004), *Content Analysis: An Introduction to Its Methodology*, Sage Publications Inc., Thousand Oaks, CA
- Kristiansen, S. and Santoso, P. (2006), “Surviving decentralisation? Impacts of regional autonomy on health service provision in Indonesia” *Health Policy*, Vol.77, No.3, pp.247–59
- Kusumasari, B. and Alam, Q. (2012), “Local wisdom-based disaster recovery model in Indonesia”, *Disaster Prevention and Management*, Vol.21 No.3, pp.351 - 69
- Leitmann, J. (2007), “Cities and calamities: learning from post-disaster response in Indonesia”, *Journal of Urban Health*, Vol. 84, No.3 Suppl, pp.i144–i153.
- MacRae, G. and Hodgkin, D. (2011), “Half full or half empty? Shelter after the Jogjakarta earthquake”, *Disasters*, Vol.35 No.1, pp.243-67
doi:10.1111/j.1467-7717.2010.01202.x.
- Migl, K.S. and Powell, R.M. (2010), “Physical and Environmental Considerations for First Responders”, *Critical Care and Nursing Clinics of North America*, Vol.22 No.4, pp.445-54
- Ministry of Health (2006), *Preliminary Damage and Loss Assessment Yogyakarta and Central Java Natural Disaster, The 15th Meeting of The Consultative Group on Indonesia Jakarta*, Ministry of Health, Republic of Indonesia, Jakarta.
- Ministry of Health (2007), *Indonesia Health Profile 2005: Self Motivated community to Live Healthy Lives*, Ministry of Health, Republic of Indonesia, Jakarta.
- Ministry of Health (2010), *Indonesia Health Profile 2008*, Ministry of Health,

Republic of Indonesia, Jakarta

- Murray, J.S. (2010), "Responding to the psychosocial needs of children and families in disasters", *Critical Care and Nursing Clinics of North America*, Vol. 22 No.4, pp.481-91, doi: 10.1016/j.ccell.2010.09.002
- Raharjo, E., Koeshartono, P. and Wiroatmodjo, K. (2008), "Toward More Efficient Multinational Work Rescue and Aid for Disasters: Lessons Learned during the Aceh Tsunami and Work on Rescue and Yogya Earthquake", *Prehospital and Disaster Medicine*, Vol.23 No.4, pp.301-30.
- Ranse, J. and Lenson, S. (2012), "Beyond a clinical role: Nurses were psychosocial supporters, coordinators and problem solvers in the Black Saturday and Victorian bushfires in 2009", *Australasian Emergency Nursing Journal*, Vol.15 No.3, pp.156-63
- Red Cross and Red Crescent (2010), *Final report Indonesia: Yogyakarta Earthquake*, International Federation of Red Cross and Red Crescent Societies, Geneva, Switzerland, available at: http://reliefweb.int/sites/reliefweb.int/files/resources/19B64EE6C5E1E1BFC12577D7003B65DFFull_report.pdf (accessed 10 November 2012)
- Richardson, S., Ardagh, M., Grainger, P. and Robinson, V. (2013), "A moment in time: emergency nurses and the Canterbury earthquakes", *International Nursing Review*, Vol.60 No.2, pp.1188-95, DOI: 10.1111/inr.12013
- Ronsmans, C., Achad, E., Brauholtz, D., Graham, W.J., Marshall, T., Pambudi, E., Qomariyah, S.N., Scott, S. and Witten, K.H. (2009), "Professional assistance during birth and maternal mortality in two Indonesian districts", *Bulletin of the World Health Organization*, Vol.87, No.6, pp.416-23
- Schlehe, J. (2010), "Anthropology of religion: Disasters and the representations of tradition and modernity", *Religion*, Vol. 40 No.2, pp.112-20
- School of Nursing (2008), *Empowering Local Community by Developing the Emergency Response Team and Empowering Handicapped Person in Bantul District, Yogyakarta Special Province. Indonesia Monthly report, 1-30 June 2007*, School of Nursing, Faculty of Medicine, Gadjadara University, Yogyakarta
- Shields, L. and Hartati L.E. (2003), "Nursing and health care in Indonesia", *Journal of Advanced Nursing*, Vol.44 No.2, pp.209-16.
- Shields, L. and Hartati L.E. (2006), "Primary Care in Indonesia", *Journal of*

- Child Health Care*, Vol.10, No.1, pp.4–8.
- Sloand, E., Ho, G., Klimmek, R., Kub, J. and Pho, A. (2012), “Nursing children after a disaster: a qualitative study of nurse volunteers and children after the Haiti earthquake”, *Journal for specialists in pediatric nursing*, Vol. 17 No.3, pp. 242-53
- Stangeland, P.A. (2010), “Disaster Nursing: A Retrospective Review”, *Critical Care Nursing Clinics of North America*, Vol.22 No.4, pp.421-36
- Steiert, M.J.W. (2007), “Disaster Preparedness”, *AORN JOURNAL*, Vol.86 No.2, pp.175–76.
- Sundram, S., Ahsan, A., Chaudhry, H.R., Chowdhury, S., D'Souza, R., Dongfeng, Z., Firoz, A.H., Hamid, M.A., Indradjaya, S., Karim, M.E., Ladrido-Ignacio, L., Maramis, A., Mufti, K.A.,
- Math, S.B., Mustafizur, R.A., Naeem. F., Nagaraja, D., Shinfuku. N., Somasundaram, D., Udomratn, P., Wahab, M.A. and Yizhuang, Z. (2008), “Psychosocial responses to disaster: An Asian perspective”, *Asian Journal of Psychiatry*, Vol.1 No.1, pp.7-14
- Tanichi, M., Saito, T., Shigemura, J., Tatsuki, T. and Wakizono, T (2012) “What is important in disaster relief missions associated with the Great East Japan Earthquake: lessons from disaster relief missions to the Japan Self-Defense Forces Sendai Hospital and Haiti peacekeeping deployments”. [Article in Japanese] *Seishin Shinkeigaku Zasshi*, Vol.114 No.11, pp.1291-96.
- UN/OCHA (UN Office for the Coordination of Humanitarian Affairs) (2006) *OCHAGENEVANATURAL DISASTER BULLETIN N° 5 /May-August*, New York, USA, available at:
<http://reliefweb.int/sites/reliefweb.int/files/resources/7B3F5AAC139A8825C12571FF004D7E27-ocha-gen-31aug.pdf> (accessed 10November 2009)
- US AID (2006) *Indonesia-Earthquake, Fact Sheet #16, Fiscal Year (FY) 2006*, U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT, Washington DC, USA, available at:
<http://www.cidi.org/wpcontent/uploads/indonesia-earthquake-fs2006-16-2006-08-25.pdf> (accessed 10November 2009)
- Vane, E.A.P. and Hull, M.S. (2008) “Perioperative Staff Resiliency During Times of War and Disasters”, *Perioperative Nursing Clinics*, Vol.3 No.1, pp.73-84
- Williams, J., Nocera, M. and Casteel, C. (2008), “The effectiveness of disaster training for health care workers: a systematic review”, *Annals of Emergency Medicine*, Vol.52 No.3, pp.211-22

- World Health Organization (2006), *Indonesia Country Profile*, Geneva, Switzerland, available at: <http://www.who.int/disasters/repo/9062.pdf> (accessed 19 January 2013)
- World Health Organization (2007), "Saving mother's lives in rural Indonesia", *Bulletin of the World Health Organization*, Vol.85 No.10, pp.740–41.
- World Health Organization and International Council of Nurses (2009), *ICN Framework of disaster Nursing Competencies*, World Health Organization and International Council of Nurses, Geneva
- Yamazaki, M., Minami, Y., Sasaki, H. and Sumi, M. (2011), "The psychosocial response to the 2011 Tohoku earthquake", available at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3165986/pdf/BLT.11.093997.pdf> (accessed 10 September 2013)
- Yang, Y.N., Arbon P., Cheng, H.Y., Xiao, L.D. and Zhu, J.C. (2010), "Chinese nurses' experience in the Wenchuan earthquake relief", *International Nursing Review*, Vol.57 No.2, pp.217-23, doi:10.1111/j.1466-7657.2009.00795.
- Zhen, Y., Deng, X.Y., Huang, Z.Q., Jin, J., Wang, J.G. and Zhang, L.P. (2012), "Posttraumatic Stress Disorder of Red Cross Nurses in the Aftermath of the 2008 Wenchuan China Earthquake", *Archives of Psychiatric Nursing*, Vol.26 No.1, pp.63-70