Evaluation of an Australian nursing partnership to improve disaster response capacity

Authors:

Marion Mitchell

Centre for Health Practice Innovation Griffith Health Institute,

Griffith University, Brisbane, Australia and Intensive Care Unit,

Princess Alexandra Hospital, Brisbane, Australia

Benjamin Mackie

Institute for Resilient Regions, University of Southern Queensland,

Toowoomba, Australia

Leanne M. Aitken

Centre for Health Practice Innovation Griffith Health Institute,

Griffith University, Brisbane, Australia; Intensive Care Unit,

Princess Alexandra Hospital, Brisbane, Australia and School of Health Sciences,

City University London, London, UK, and

Loretta C. McKinnon

Centre for Health Practice Innovation Griffith Health Institute,

Griffith University, Brisbane, Australia and Intensive Care Unit,

Princess Alexandra Hospital, Brisbane, Australia

Keywords: Aftercare, Disasters, Emergency response, Intensive care, Nursing partnership,

Operating theatre

Abstract

Purpose

To evaluate a partnership with specialised nurses from geographically disparate hospitals to provide critical support in national disasters.

Background

The Australian Government established the National Critical Care Trauma Response Centre (NCCTRC) within Royal Darwin Hospital (RDH). A partnership with the Princess Alexandra Hospital (PAH) Brisbane occurred to support RDH during national disasters. PAH nurses undertook two-week rotations to RDH in readiness for deployment.

Methodology

PAH, NCCTRC and RDH nurses' perceptions of the efficacy of the nurse rotations were explored in surveys and focus groups.

Findings

PAH nurses felt they were well equipped for practice in RDH and the partnership developed professional reciprocity with the PAH nurses feeling respected, valued and part of the RDH team. This finding of adequate preparation and effective integration was consistent with the perceptions of senior staff from the participating organisations.

Value

This unique partnership created a well-prepared team to provide support in a national disaster.

Introduction

Internationally, recent disasters have resulted in significant injuries and loss of human life. Australia is no exception and has recently prepared for, and responded to terrorist events, such as bombings in Bali, and large disasters including tsunamis, cyclones, bushfires and floods. In 2005 the Australian Government recognised the need for a national approach in responding to disasters and established the National Critical Care Trauma Response Centre (NCCTRC) within Royal Darwin Hospital (RDH) in the Northern Territory, Australia. Darwin was deemed the most strategic location for the NCCTRC due to its geographical proximity to Asia and the tropics.

A first step in equipping the NCCTRC to respond in the event of a disaster was to secure a sufficient on-call workforce. A hospital partnership was deemed the most effective way to secure necessary staff numbers and the RDH and Princess Alexandra Hospital (PAH) in Brisbane were selected for this purpose. In this paper we examine the partnership which comprised intensive care (ICU), emergency department (ED), and operating theatre (OT) nurses. This appears to be the first paper to evaluate such a nursing partnership, highlighting the international importance of this study for disaster services and hospital managers and administrators.

Background

The impact of disasters is increasing across the world. It is estimated that over 15 million people in Australia alone were affected by disaster during the last decade (Brandt *et al.,* 2003). In addition, acts of terrorism, animal and human diseases and the heightened movement of people globally increase the potential for various types of health related catastrophes (Brandt et al., 2003; International Federation of Red Cross and Red Crescent Societies, 2000). It is imperative that hospitals are adequately prepared for potential disasters (Rosenfeld et al., 2005; Achour and Price, 2010).

Universally, nurses constitute the largest group of health care providers and their readiness to respond is crucial for community resilience to disasters (Pang et al. 2008). Since Florence Nightingale's time through to current day, nurses have prepared fellow nurses for patient care around disasters (Leifer and Glass, 2008). Effective patient care in a disaster requires reliable trained teams that form the corner-stone of disaster preparedness (Autrey and Moss, 2006).

The role of the PAH in the partnership was to supply crucial back-fill staff to RDH in the event of a disaster. To achieve this, PAH nursing staff had to be work-ready to step into their respective specialty unit in the RDH to seamlessly provide care to RDH patients. This allowed RDH nursing staff competent in disaster care, to be relieved to provide critical care wherever it was needed.

Volunteer PAH nurses were required to have a minimum of five years experience in their speciality, leadership skills, and an ability to work well in small teams in stressful situations. Those selected spent an initial two-week period in their respective units in RDH for unit orientation purposes. A second rotation of one-week occurred around 12 months later to consolidate learning and maintain relationships with RDH colleagues. Four rotations of PAH nurses who went to the RDH are reported here.

Methods

A pragmatic mixed methods approach was used comprising surveys and focus groups to explore PAH, NCCTRC and RDH nurses' perceptions of the efficacy of the nurse rotations. Combining qualitative and quantitative methods can facilitate a comprehensive assessment of the phenomena under study and can enhance understanding by incorporating multiple perspectives (Creswell, 2009; Jones and Bugge, 2006; Annells and Whitehead 2007). The assessment of the data undertaken represents a descriptive analysis of the responses of the 23 participants.

Sites

The two sites were the RDH and PAH. Both hospitals are large, metropolitan, tertiary teaching hospitals with broad health care activity. Although PAH is located 3,500 kilometres from Darwin, it represents one of their closest metropolitan areas and specialist referral centres. The RDH provides speciality services to the Darwin urban population and serves as a referral centre to the Northern Territory, northern Western Australia and South-East Asia. The population serviced is approximately 150,000 people. In spite of the smaller size of the RDH, the ED attends to an additional 10,000 presentations per year over those seen at PAH (see Table 1).

Table 1. *PAH and RDH Hospital Profiles (2010-2011)* [a]

Characteristics	PAH	RDH
Beds	750	363
Nursing Staff	2, 691	1, 250
Hospital Admissions/year	86,870	49, 477
1. Emergency Department Presentations	46,150	57, 112
2. Operating theatre cases	19, 899	10, 806
3. Intensive Care Unit admissions	2,194	834[b]
4. Outpatient appointments	441,373	175, 400

[a]PAH = Princess Alexandra Hospital; RDH = Royal Darwin Hospital.
[b]RDH has a combined high dependency and intensive care unit.

Sample

Participants were: PAH nurses who went to RDH (defined here as Disaster Response Service (DRS) members) and PAH, RDH and NCCTRC senior nurses from participating organisations. The term 'senior nurses' included educators, Nurse Unit Managers, Clinical Nurse Consultants, and Directors of Nursing. Participation was voluntary.

Data collection

Data collection included surveys and focus groups conducted by the lead author; a PAH researcher with no affiliation with the DRS, NCCTRC or RDH. Data collection occurred following a six-month period wherein four rotations had occurred. Broad questions were asked relating to participant's perceptions of the manner in which the program prepared them to be able to support RDH in a disaster and any issues that arose from being involved in the partnership. Transcripts were prepared from the notes taken at each focus group and these were later emailed to participants for verification on their accuracy and completeness. Identified changes were made.

Surveys were completed by PAH and RDH participants prior to, and after rotation of PAH nurses to RDH. The pre-rotation survey for DRS members was designed to assess participants':

- understanding of the program, and various roles within the DRS perceived preparedness for the RDH rotation after a one-day orientation at PAH , and
- Perceived impact on their family.

The post-rotation survey for DRS members contained the pre-rotation questions. In addition, items were added from the Halfer-Graf Job/Work Environment Nursing Satisfaction Survey (Halfer and Graf, 2006); a reliable and valid tool for assessing job satisfaction and RNs' perceptions of their work environment. Ongoing recruitment and retention of PAH nurses within the DRS was considered essential for the program's viability. The survey included items related to:

- competence (e.g. "I have the knowledge and skills to perform my role")
- perceptions of the work environment and degree of 'job fit'(e.g. "I can manage role demands"), and
- sources of professional fulfilment (e.g. "Acceptance by RDH multi-disciplinary team").

A pre-rotation survey for senior staff at both PAH and RDH asked for participants' perceptions of the impact on their unit's staffing, skill mix and culture. Participants' perceptions of the actual impact on the above areas were subsequently explored in the post-rotation survey. The surveys were pilot tested for understanding, clarity and intent.

Data analysis

Descriptive statistics were generated using *Predictive Analysis* Software (SPSS Version 19). The qualitative data were assessed using a thematic content analysis. Two researchers independently assessed the data to derive codes based on identified meanings, topics, concerns or keywords. These researchers then collaboratively constructed themes from the codes identified. Illustrative quotes are provided to enhance the trustworthiness and credibility of the qualitative results (Annells and Whitehead, 2007). Consistent with current recommendations, the use of mixed methods facilitated a comprehensive understanding of the perceptions of the partnership program (Creswell, 2009; Jones and Bugge, 2006).

Ethical approval was received from all relevant parties prior to the commencement of the study. Focus group participants completed consent forms. Participation in the survey was deemed as consent.

Results

Four rotations to RDH occurred during the six-month study period in 2010. Generally, two staff were sent from each of the represented units (ICU, ED and OT) on each rotation, resulting in six PAH staff being at RDH at any one time. In total, 23 PAH nurses participated in the four rotations (see Table 2).

Table 2. *Summary of DRS nursing numbers and clinical areas rotating to RDH (N=23)*

Rotation	Unit areas[a] (*n*)			
	ICU	ED	OT	All units
1	2	2	2	6
2	2	2	2	6
3	1	2	2	5
4	2	2	2	6
Total	7	8	8	23

[a]ICU = Intensive Care Unit, ED = Emergency Department, OT = Operating Theatre.

PAH DRS nurses worked in their respective unit at RDH for a two-week period for five, eight hour shifts each week. All PAH DRS members responded to the surveys (n=23). Six focus group discussions occurred with a total of 33 participants. Twenty were PAH staff members (DRS members = 15; senior PAH staff = 5), and the remaining were from Darwin (senior RDH nurses = 10; NCCTRC nurses=3). The results from the focus group discussions and the surveys were integrated and are reported here.

Findings related to nursing practice

Prior to attending the RDH the PAH DRS participants indicated that they had some understanding of their and others' roles. However, in the post-rotation period, DRS participants demonstrated that they had a greater understanding and further insight following the two-week period at RDH. They considered that they had the knowledge and skills to perform their role in their respective speciality areas in RDH and understood the associated expectations. In addition, universally they felt that they had developed effective working relationships with RDH unit staff and were well accepted by these co-workers. They felt that their expertise was valued by the RDH staff.

The survey results were supported by the findings of the focus group discussions where a common theme emerged that the PAH DRS nurses felt *well equipped for practice* which stemmed from their underlying experience, their desire to be challenged and the support they received from their RDH colleagues. The nurses highlighted that to become confident in the new setting they concentrated on understanding the RDH systems: "I tried to fit into the RDH system, so it was important to understand RDH processes."

Overall PAH DRS nurses felt confident and clinically prepared to care for most patient groups. However, some expressed reservations about their capacity to care for paediatric patients. ,

"Caring for paediatric patients was of concern – I did not feel confident looking after them."

When asked how well prepared they felt should they be required to return to RDH at short notice. PAH DRS members indicated that they felt 'very well prepared' (n=10), 'well prepared' (n=7) or 'somewhat prepared' (n=6).

In addition to the clinical aspects of care a theme emerged relating to the *development of professional reciprocity.* The PAH DRS members indicated that they were well respected and valued by RDH staff and that they were seen as part of the team. Princess Alexandra Hospital DRS nurses volunteered to perform overtime which was highly regarded by RDH staff. In addition, PAH DRS nurses led some procedures (e.g. PAH theatre nurses coordinated the nursing aspect of operations in some instances when they were the most experienced staff member in the operating theatre). Feedback from RDH senior staff indicated that PAH DRS nurses integrated well to all units and they enhanced the knowledge of RDH staff by giving presentations and sharing policies or offering ad hoc education sessions.

A sense of trust was felt to have developed between the PAH DRS nurses and RDH staff during the rotations as all were intent on making the partnership a success. The PAH DRS nurses spoke about how they wanted to assimilate – one said: "We wanted to fit into the RDH system, and not try to change it." The partnership benefited both the PAH DRS and RDH nurses as they learnt from each other.

Ten senior nurses from PAH, NCCTRC and RDH completed two surveys with representation from all clinical areas (62% response rate). They were asked for their *perceptions* of the impact of the rotations on the pre-rotation survey and then the *actual* impact of the rotations on the post-rotation survey. Some PAH senior nurses over-estimated the impact (of nurses going to Darwin) on their ability to adequately roster for their unit's needs. Most staff accurately predicted that having the APH DRS nurses at the RDH would positively influence the unit culture in both hospitals. Data from the senior RDH staff focus groups (n=13) supported the survey findings: "There was positive feedback about PAH [DRS] staff from medical colleagues and nursing staff"; and "We were able to integrate PAH [DRS] staff into clinical areas really easily – they were all senior, experienced nurses.**"**

Participants in the focus groups highlighted some logistical concerns should a disaster occur including the provision of accommodation close to the RDH and the ability of the PAH to release staff on demand. Participants did not perceive these issues as insurmountable.

Findings related to family concerns

PAH DRS nurses were asked pre-rotation about the likely impact of the rotations on their family members (who remained in Brisbane while the PAH DRS team member was in Darwin). Most staff thought that the rotations would have 'no impact' (35%, n=8) or 'some impact' (52%, n=12), with fewer staff predicting a 'moderate impact' (9%, n=2) and no staff reporting a 'large impact' (missing, n=1). The reality of the rotations was appraised as slightly less disruptive to families than expected. In the post-rotation survey PAH nurses either indicated that the rotations had 'no effect' (48%, n=11) or 'some effect' (43%, n=10) on their families. No staff member indicated that the rotations either had a 'moderate' or 'large' impact on their family (missing, n= 2).

Discussion

Preparedness is an essential element of disaster management as it has the capacity to reduce suffering of survivors and loss of life (WHO and ICN, 2009). Preparedness includes building a ready nursing workforce (Roccaforte and Cushman, 2002). In this partnership, nurses from an interstate hospital were recruited to give critical back-up to the RDH staff in the event of a disaster. The evaluation highlighted important gaps in the PAH DRS team knowledge, fostered greater understanding of their job satisfaction as part of the DRS, and identified ways to improve the system.

To optimize the effectiveness of the DRS rotation program, retention of PAH nurses was essential. Job satisfaction is a major factor in staff retention (Larabee et al., 2003; Robert, Jones and Lynn, 2004; Sawatzky and Enns, 2012) and a number of features of the work environment known to impact on job satisfaction including: resource access, team membership, work schedule, and perceived competence were examined in the survey.

The origins of job satisfaction identified across studies are relatively consistent; with working conditions, collegial relationships and autonomy being common themes (Lu et al., 2012). Job satisfaction has been linked to being engaged in work that is satisfying and stimulating (Sawatzky and Ennis, 2012). It fosters a personal

commitment to the work place which was pertinent in relation to this nursing partnership. The positive relationship between high levels of job satisfaction and retention (Schaufeli et al., 2006; Lu et al., 2012), was evident in the current study where PAH DRS participants indicated their satisfaction with the program. In addition to job satisfaction, family commitments have also been noted as an important influence on nurses' capacity to respond to calls for assistance during a disaster (Arbon et al., 2013a; Arbon et al., 2013b). The low impact of the rotations reported on families of the team members is likely to have had a positive impact on retention in the partnership program.

The period of two-weeks in the RDH was considered adequate and the PAH DRS nurses felt confident that they could provide most aspects of patient care should they be called upon in a disaster situation. There was one exception to this sense of preparedness, with some PAH DRS nurses in ED and ICU lacking confidence in relation to pediatric patient care. This concern is not unexpected as the PAH does not admit children, however, it highlights a clinical requirement that needs to be addressed.

Work-place learning has long been recognized for its ability to guide, develop and legitimize adult learning that occurs in practice. It provides the opportunity to help the learner be aware of the cognitive processes underpinning clinical expertise and performance (Billett, 2001). Although there are many similar features within specialty areas (such as every-day equipment), there are also differences that are best addressed in the actual workplace where participation makes evident individual learning needs for work readiness (Billett, 2006). The PAH DRS nurses considered that being on-site in the RDH workplace enabled them to understand and confidently work within the RDH systems. In the case of a disaster, knowing the departmental and hospital response strategy supports staff preparedness to respond (Duong, 2009).

Experiencing a positive working culture is an important feature of successful work relationships that impact on overall organizational functioning (Nelson and Quick, 2008). Nurses in this study considered there were strong, positive ward cultures in both the RDH and the PAH units. The PAH DRS nurses felt valued, accepted and able to question their RDH colleagues. This type of positive working culture is known to support employee satisfaction, facilitate effective open communication, foster valuing of new ideas, and promote excellence in care (Armstrong, 2010). The decision to involve only experienced PAH nurses with strong leadership and team

work ability was a strength of the program; the RDH staff readily identified the benefits and advantages of having the PAH nurses in their workforce.

Conclusion

There is a paucity of literature on how nurses can practically contribute within health services in relation to national plans to adequately mitigate, prepare and respond to disasters. Insight was gained into a unique partnership between the NCCTRC, RDH and PAH which are over 3,000 kilometres apart.

On-site orientation successfully prepared specialist nurses to provide support in the event of a national disaster. The PAH DRS members were recognised for their expertise and integrated effectively into the RDH. The PAH DRS nurses considered they were well prepared by the work-place learning they completed and the positive work culture that was created promoted high levels of job satisfaction. This finding of adequate preparation and effective integration was consistent with the perceptions of senior staff from the participating organisations. It was evident that clinical knowledge deficits existed in the area of paediatric patient care and these should be addressed. A hospital's capacity to provide an effective response during a disaster is strongly linked to its ability to recruit additional appropriately qualified staff at short notice; preparation for this was achieved through this unique partnership. Similar partnerships are encouraged.

References

Achour N. and Price ADF. (2010), “Resilience strategies of healthcare facilities: present and future”, *International Journal of Disaster Resilience in the Built Environment*, Vol. 1 No. 3, pp. 264-76.

Annells M, Whitehead D. (2007), “Analysis data in qualitative research”. In: Schneider Z, Whitehead D, Elliott D, Lobiondo-Wood G, Haber J. *Nursing & midwifery research : methods and appraisal for evidence-based practice (3rd edition)*, Elsevier, Sydney, pp. 138-55.

Arbon P, Cusack L, et al. (2013a), "Exploring staff willingness to attend work during a disaster: A study of nurses employed in four Australian emergency departments." *Australasian Emergency Nursing Journal*, Vol. 16 No. 3, pp. 103-9.

Arbon, P, Ranse J, et al. (2013b). "Australasian emergency nurses’ willingness to attend work in a disaster: A survey." *Australasian Emergency Nursing Journal*, Vol. 16 No. 2, pp. 52-7.

Armstrong M, (2010), *Armstrong’s essential human resource management practice: a guide to people management*, Kogan Page Ltd, London.

Autrey P, Moss J. (2006), “High-Reliability teams and situation awareness implementing a hospital emergency incident command system”. *Journal of Nursing Administration*, Vol. 36 No. 2, pp. 67-72.

Billett S. (2001), *Learning in the Workplace: Strategies for Effective Practice*. Allen & Unwin, St Leonard, NSW.

Billett, S. (2006), “Constituting the workplace curriculum”. *Journal of Curriculum Studies*, Vol. 38 No. 1, pp. 31–48.

Brandt DA, Abraham K, Franks R. (2003), “A strategic plan for disaster medicine in Australasia”. *Emergency Medicine*, Vol.15, No. 3, pp. 271-282.

Creswell JW. (2009) , *Research design: qualitative, quantitative, and mixed methods approaches*, Sage Publications, Thousand Oaks, California.

Duong, K. (2009), “Disaster education and training of emergency nurses in South Australia”, *Australasian Emergency Nursing Journal*, Vol. 12, No. 3, pp. 86-92.

Halfer D, & Graf E. (2006), “Graduate nurse perceptions of the work experience”, *Nursing Econonomics*, Vol. 24, No. 3, pp. 150-55.

World Health Organization (WHO) and International Council of Nurses (ICN) (2009), “Framework of Disaster Nursing Competencies”, Geneva, ICN, available at

http://myweb.polyu.edu.hk/~hswhocc/resource/D/2009DisasterNursingCompetencies.pdf (accessed 10 January 2014).

International Federation of Red Cross and Red Crescent Societies. (2000),*World Disasters Report 2000*, International Federation of Red Cross and Red Crescent Societies, Geneva.

Jones A, Bugge C. (2006), "Improving understanding and rigour through triangulation: an exemplar based on patient participation in interaction", *Journal of Advanced Nursing*, Vol. 55, No. 5, pp. 612-21.

Leifer S.L. Glass L. K. (2008), "Planning for Mass Disaster in the 1950s", *Nursing Research*, Vol. 57, No.4, pp. 237–244.

Lu H, Barriball KL, Zhang, X, et al. (2012), "Job satisfaction among hospital nurses revisited: A systematic review". *International Journal of Nursing Studies*, Vol 49, pp. 1017–38.

Nelson D L, Quick JC. (2008), "Understanding Organizational Behaviour", 3rd Edition. Mason USA: Thomson.

Pang S, Chang S, Cheng Y. (2009), "Pilot training program for developing disaster nursing competencies among undergraduate students in China", *Nursing and Health Sciences*, Vol. 11, pp. 367-373.

Roberts BJ, Jones C, Lynn M. (2004), "Job satisfaction of new baccalaureate nurses". *Journal of Nursing Administration*, Vol. 34, No. 9, pp. 428-35.

Roccaforte JD, Cushman J G. (2002), "Disaster preparation and management for the intensive care unit", *Current Opinion in Critical Care*, Vol. 8, pp. 607–615.

Rosenfeld JV, Fitzgerald M, Kossmann T, et al. (2005), "Is the Australian hospital system adequately prepared for terrorism?" *Medical Journal of Australia*. Vol. 183, No. 11, pp. 567-70.

Sawatzky JA, Enns, CL. (2012), "Exploring the key predictors of retention in emergency nurses". *Journal of Nursing Management*, Vol. 20, pp. 696–707.

Schaufeli WB, Bakker AB, Salanova M. (2006), "The measurement of work engagement with a short questionnaire: a cross-national study", *Educational and Psychological Measurement*, Vol. 66, pp. 701–16.