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A participatory action research approach

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Reducing occupational stress among registered nurses in very remote Australia: A participatory action research approach

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ARTICLE INFO

ABSTRACT

Background: Nurses in very remote areas of Australia (RANs), work in complex and isolated settings for which they are often inadequately prepared, and stress levels are high. This paper, based on the 'Back from the edge' project, evaluates the development and implementation of an intervention to reduce and prevent the impact of occupational stress in the RAN workforce in the Northern territory.

Methods: The methods involved a combined participatory action research/organisational development model, involving seven steps, to develop and implement system changes within the (then) Northern Territory Department of Health and Families (NTDH&F). The development, implementation and evaluation was informed via information from participants collected during workshops and interviews. Pre and post surveys were undertaken to evaluate the study.

Results: Occupational stress interventions developed by the workgroups were categorised into four main groups: (1) remote context, (2) workload and scope of practice, (3) poor management, and (4) violence and safety concerns. The main interventions centred on promoting a well educated, stable workforce. There were very few measurable changes as a result of the interventions as many were not able to be implemented in the time period of the study, but implementation is continuing.

Conclusion: While the outcome evaluations showed few effects, the study through consensus approaches, provides a blueprint for reducing stress among remote area nurses and evidence which should inform policy and practice with respect to service delivery in remote areas.

1. Background

Remote area practice is characterised by geographical, social and professional isolation - servicing a small, dispersed and highly mobile population with, high morbidity and mortality, climatic extremes, an extended practice role, a multidisciplinary approach and cross-cultural issues affecting everyday life (Wakerman 2004). Nurses who work in remote areas in Australia are called remote area nurses or 'RANs', and are defined as

...specialist practitioners that provide and co-ordinate a diverse range of health care services for remote, disadvantaged or isolated populations within Australia and her Territories and undertake appropriate educational preparation for their practice (CRANA 2003).

Nurses working in very remote areas, as defined by the Accessibility/Remoteness Index of Australia (ARIA +) (AIHW, 2004), are the mainstay of health services in these regions (Lenthall, Wakerman, Dollard et al., 2011). They work in complex and isolated settings that are often cross cultural, and for which they are usually inadequately prepared (Lenthall, Wakerman, Opie, M. Dollard et al., 2011).

Discussions between different health, professional and university groups in the Northern Territory identified occupational

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stress among RANs as a problem. In 2008, the, Northern Territory Department of Health and Families (NTDH&F), Council of Remote Area Nurses of Australia plus (CRANAplus), Commonwealth Health Department, Office of Aboriginal and Torres Strait Islander Health, Katherine West Health Board, Centre for Remote Health, Flinders University and University of Northern British Colombia, Canada, agreed to be partners on a successful Australian Research Council Linkage grant, 'Back from the edge: reducing occupational stress among RANs in the Northern Territory'. The ensuing study aimed to describe stressors, measure levels of occupational stress in RANs, and develop, implement and evaluate interventions that reduce and prevent the impact of occupational stress in the remote area nursing workplace. The first part of the study, described stressors and measured levels of occupational stress in RANs via a survey to all registered nurses in very remote Australia (Opie, Dollard et al., 2010). Given the high demand and under resourced environment, an extended Job Demands-Resources (JD-R) model (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001) was adopted to examine stress among RANs. The model proposes that worker well-being is affected by a number of variables that can be categorised as either job demands or job resources. Job demands become stressors when the employee is required to expend considerable effort in order to meet them, with possible outcomes such as psychological distress and emotional exhaustion. In contrast, job resources serve a motivational function and may lead to positive work outcomes, such as work engagement and job satisfaction (Opie, Dollard et al., 2010). Additionally our model proposed a number of system capacity factors that could influence demands and resources, such as the climate for worker psychological health (i.e., psychosocial safety climate, Dollard & Karasek, 2010), flexible/adaptable culture (Lenthall, Wakerman, Opie, M.F. Dollard et al., 2011), consultation & preparation (Lenthall, Wakerman, Dollard et al., 2011), and communication systems (Lenthall, Wakerman, Dollard et al., 2011).

The results of the first survey confirmed that RANs suffer high levels of occupational stress and emotional exhaustion (Opie, Dollard et al., 2010). However, RANs also reported high levels of work engagement and moderate levels of job satisfaction. The job demands most strongly associated with increased levels of occupational stress, as assessed by emotional exhaustion and symptoms of post-traumatic stress disorder (PTSD), were: emotional demands, responsibilities and expectations, social issues, workload, staffing issues, poor management, isolation, safety concerns, violence, the remote context, culture shock, difficulties with equipment and infrastructure, and lack of support (Opie et al., 2009). This paper presents the results of the second part of this study, namely developing, implementing and evaluating interventions that potentially reduce and prevent the impact of occupational stress in the remote area nursing workforce in the Northern Territory.

1.1. Occupational stress interventions

Occupational stress interventions may be categorised by the type and level of application. Primary interventions are aimed at reducing exposure to psychologically harmful working conditions; secondary, or stress management, interventions are aimed to enable people to use skills to deal with potentially harmful working conditions; and tertiary interventions are aimed to treat people who have been harmed in some way by work related stress (Keegel et al., 2007; Lamontagne, Keegel, Louie, Ostry, & Landsbergis, 2007). Interventions may also be categorised according to their target: individual, group, or the organisation (Cox, Karanika, Griffiths, & Houdmont, 2007; Bergerman, Corabian, & Harstall, 2009; Giga, Cooper, & Faragher, 2003; Karanika et al., 2007,). Most interventions in the literature have aimed at the individual level (Cox et al., 2007). A meta-analysis to determine the effectiveness of stress management interventions found that relaxation interventions were

most frequently used, while organisational interventions, although described as potentially the most effective, continued to be scarce (Richardson & Rothstein 2008). Rather than target the individual or the team, the 'Back from the Edge' project aimed to develop primary, secondary and tertiary occupational stress interventions, since comprehensive approaches are most effective (Lamontagne et al., 2007).

1.2. Intervention framework

This intervention aspect of the study is based on the action research model of planned change, which involves both participatory action research (M.F. Dollard, le Blanc, & Cotton, 2008) and organisational development. Participatory action research is a collective, self-reflective inquiry that researchers and participants undertake together so they can understand and improve upon the practices in which they participate, and the situations in which they find themselves (Baum, MacDougall, & Smith, 2006). Organisational development is 'the process of increasing organisational effectiveness and facilitating personal and organisational change through the use of interventions driven by social and behavioural science knowledge' (Anderson 2010; p 3). The combined participatory action research/organisational development (PAR/OD) model, an adaptation of Cummings model, (Cummings & Worley, 2008) was adopted to develop and implement system changes within the NTDH&F. It involved seven 'steps', with steps four to six being repeated in a cyclical framework (Fig. 1). This model was particularly pertinent as this was an attempt to effect organisational change through the harnessing of necessary management and front-line staff commitment and solutions. In line with PAR principles, it attempted to address power relationships by adopting a bottom up approach aimed to form a partnership with participants (Dollard et al., 2008). Problem solving and enquiry was encouraged and dialogue was used to critically examine reality and try to reach agreement on a shared reality.

1.3. Ethics approval

Ethics approval was granted by the Central Australian Human Research Ethics Committee, the Top End Human Research Ethics Committee and two university research ethics committees.

2. Methods

The target population were RANs in very remote areas in the Northern Territory. Data on possible occupational stress interventions and process evaluations was gathered through workgroups of RANs and health centre managers working in remote Aboriginal communities in Central Australia and in the Top End of the Northern Territory. These groups, were facilitated by the lead investigator, generally met for a whole day, three times in the PAR/OD cycle described above. Information from the first BFTE survey were presented and then discussed by the workgroups. The workgroups then proposed numerous possible interventions. Participation at all levels of the NTDH&F was a key strategy in the intervention and the proposed interventions were then further developed in workshops with implementation committees comprising middle managers in Central Australia and in the Top End. Some interventions were implemented at the middle management level; others were referred to the high level reference group. This group was created to ensure there was capacity and commitment to implement the developed occupational stress interventions. The high level reference group comprised representatives from the NTDH&F, the Aboriginal Medical Services Alliance of the Northern Territory; the Australian Nursing Federation; the Office of Aboriginal and Torres Strait Islander Health; and the Council of Remote Area Nurses of
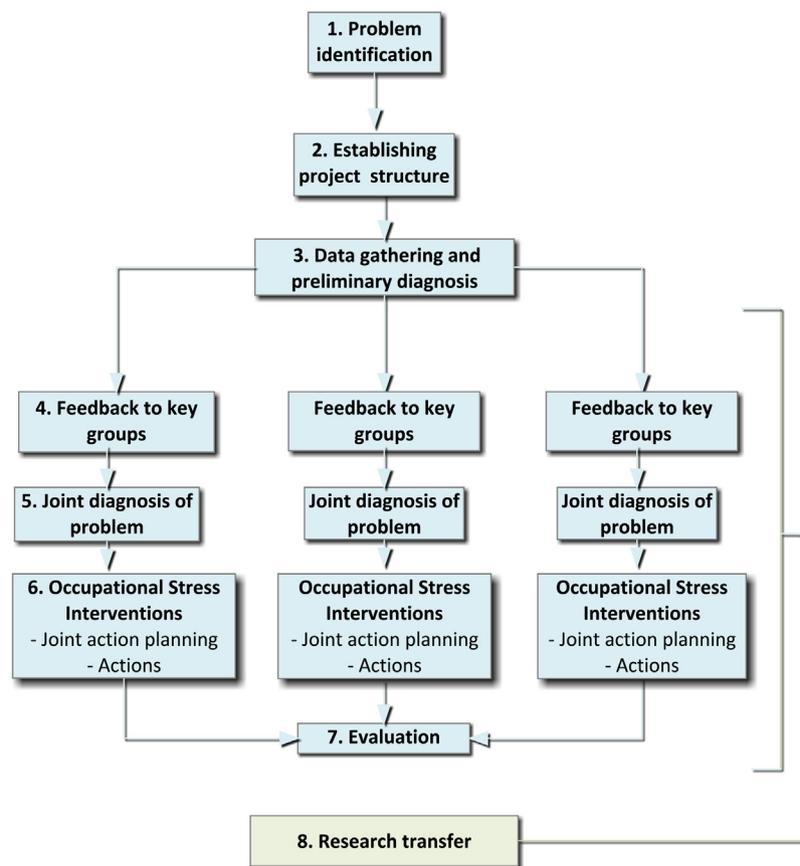
Fig. 1. The Participatory Action Research/Organisational Development Model.

Australia plus (CRANA*plus).* Other members of the research team on the group included the Director of the Centre for Remote Health and the first author of this paper. The aims and objectives, partner roles and contributions, and the study design were agreed at the beginning of the study. Three action research cycles were conducted over a 12-month period.

T-tests were used to evaluate the impact of the occupational stress interventions, based on means and standard deviations of measures used in survey one (pre-interventions) and survey two (post-interventions). Pre- and post- measures in the intervention groups, the Top End and CA in the Northern Territory and control group (all other Australian states) were compared to determine the following.

- Improvement in total system capacity including the subscales, responses of which corresponded to a 5 point scale ranging from (0) strongly disagree to (4) strongly agree, of:-
  ○ flexible/adaptable culture (Lenthall, Wakerman, Dollard et al., 2011), which included items such ' my organisation progresses effectively through change and challenges';
  ○ consultation & preparation (Lenthall, Wakerman, Dollard et al., 2011), which included items such as 'I feel I was adequately informed about the conditions of health care in their workplace prior to taking this position;
  ○ psychosocial safety climate (Dollard & Bakker, 2010; Dollard & Karasek, 2010) which included items such as 'in my organisation, senior management show support for stress prevention through involvement and commitment;
  ○ communication (Lenthall, Wakerman, Dollard et al., 2011), which included items such as 'I receive the information I need from colleagues and managers to perform my job effectively.

- Improvement in positive outcomes of:
  - work engagement, Utrecht Work Engagement Scale9, (Schaufeli & Bakker, 2003) with items such as 'I am enthusiastic about my job', and asks respondents to indicate the frequency with which they experience such feelings, on a 7-point scale ranging from 0 (never) to 6 (everyday); and
  - job satisfaction, a single item asking respondents, 'Taking everything into consideration, how do you feel about your job?' responses corresponded with a 7-point scale, ranging from (0)extremely dissatisfied to (6) extremely satisfied (Opie,Dollard et al., 2010).
- Increase in job resources, including:-
  - supervision and social support subscales from the Job Content Questionnaire (JCQ) (Karasek et al., 1998), which included items such as 'my supervisor is concerned about the welfare of those under him/her', and 'people I work with are helpful in getting the job done', responses corresponded with a 5-point scale, ranging from 0 (*strongly disagree*) to 4 (*strongly agree*);
  - opportunity for professional development, based on the work of Aiken and Patrician (2000) and included items such as 'there are active in-service/continuing education programs for me' with responses ranging from 0 (*strongly disagree*) to 4 (*strongly agree*).
  - job control and possibilities for development, from the Copenhagen Psychosocial Questionnaire (COPSOQ), (Kristensen, 2000), included such items as Items as, such as 'I can decide when to take a break' for job control and 'does your work require you to take initiative?' with responses, corresponding with a 5-point scale, ranging from 0 (*to a large extent*) to 4 (*to a very small extent*).
- Decrease in negative outcomes of:-

- psychological distress, measured by the General Health Questionnaire12 (GHQ12) (Goldberg and Williams, 1991), which includes items s such as, 'have you recently lost much sleep over worry?' responses corresponded to a 4-point scale ranging from 1 (not at all) to 4 (much more than usual);
- emotional exhaustion subscale from the Maslach Burnout Inventory (Jackson et al., 1996; Maslach, Jackson, & Leiter, 1996), which includes items such as 'I feel emotionally drained from my work', with responses corresponding with a 7-point scale ranging from 0 (never) to 6 (everyday); and
- symptoms of post traumatic stress, Post Traumatic Stress Disorder Checklist PCL (Weathers et al., 1993), which provides a list of 17 fundamental symptoms of PTSD which are clustered into three main symptom categories, including re-experiencing symptoms (e.g. nightmares or flashbacks), hyperarousal symptoms (e.g. easily startled), and avoidance and psychic numbing symptoms (e.g. trying to avoid activities, places or people). It asks respondents to rate "if and how" they have been bothered by any of the listed "reactions" (symptoms) over the past month, in relation to a traumatic experience or event, with responses corresponding with a 5-point scale ranging from (1) not at all to (5) extremely.
- Decrease in decrease in job demands – measured by the following
  - Witnessed violence and personal violence, where both asked respondents how often they had experienced different manifestations of workplace violence in the preceding 12 months, with responses corresponded with a 4-point scale ranging from (0) never to (4) four times or more, (Opie, Lenthall et al., 2010).
  - Emotional demands, using the emotional demands subscale of the COPSOQ (Kristensen, 2000) which included items such as 'does your work put you in emotionally demanding situations' with responses corresponding to a five point scale ranging from (0) very rarely/never to (4) very often/always.
  - Through the RAN Specific Stress Scale, which was developed by a focus group at the Council of Remote Area Nurses of Australia (CRANA) conference in 2007 and further refined using a Delphi technique involving repeated consultation with a panel of experts. There were twelve groups of identified stressors all corresponding to a 7-point scale, ranging from (0) never to (6) everyday, including:-

1) poor management, with management being defined as the person who has management authority over their position, for example, the manager in the Regional Centre/Town for remote area nurses, items included 'how often does your manager fail to address issues raised concerning colleagues';
2) staffing difficulties, items included 'how often do you experience inadequate staffing levels;
3) on-call, items included 'how often are you on-call 24 h a day;
4) workload, items included 'how often do you perceive your workload as unmanageable;
5) responsibilities and expectations, items included, 'how often do the responsibilities of the health service exceed the capacity of staff';
6) safety concerns, items included ' how often do you feel concerned about your personal safety;
7) social Issues, items included how often do you experience difficulty initiating or maintaining social interaction
8) isolation, items included, 'how often do you feel isolated family and friends';
9) inter-cultural factors, items included 'how often do you experience conflict between western nursing practices and prevailing cultural practices';
10) culture shock, items included 'how often do you experience uneasiness about living or working in a different culture';

11) lack of support, items included 'how often do you experience adequate mentor support';
12) infrastructure and equipment difficulties, items included 'how often do you experience difficulties with equipment'.

Data were analysed using the Statistical Package for the Social Sciences (SPSS) for Windows, version 16.

Process evaluations were conducted at workshops and committee meetings to gauge the effectiveness of the intervention process. Information pertaining to the process was also collected through minutes of meetings, observations of workshops and meetings, a diary of meetings, as well as interviews with key respondents, including two members of the high level reference group, two members of the Top End implementation group and three members of the CA implementation group.

One section of survey two, adapted from evaluation of the Victorian Workforce Authority, (Victorian Workforce Authority, 2006)asked participants about their levels of engagement in the project, levels of trust, and line manager attitudes and actions.

3. Results

3.1. Occupational stress interventions

Occupational Stress Interventions developed by the workgroups were organised into four main categories following analysis of common themes: (1) remote context, (2) workload and scope of practice, (3) poor management, and (4) violence and safety concerns. The specific interventions are listed in Table 1.

3.1.1. Remote context

The remote context impacts on all of the job demands, and a number, including emotional demands, social issues, staffing issues, intercultural factors, isolation and difficulties with equipment and infrastructure are intrinsically linked. Nearly all participants in the workgroups agreed that working in remote communities was more emotionally demanding than most other jobs they had previously undertaken. Some elements of emotional demands, such as the poor health of Aboriginal peoples, the frequency of emergencies, and the regularity of a pre-existing relationship or association between the RAN and client could not be changed by occupational stress interventions in the scope of this project. However, many of the interventions developed to address other areas, such as improved education and support, could assist RANs to cope with these demands.

RANs found social issues such as establishing professional boundaries, finding time to unwind, initiating or maintaining social interaction, and maintaining personal relationships, difficult to manage. The main intervention aimed to improve social support and interaction was to introduce internet connections in all RANs' accommodation.

Some RANs reported that staffing issues had a major impact on stress levels. They also reported a lack of relief staff. Many RANs and health centre managers reported being tired of continually orientating new staff. There was also concern expressed by some RANs about the capabilities of short-term staff and the lack of continuity of care. To address the lack of relief staff, RANs proposed to identify the number of relief positions required, and increase the number of relievers and establish a permanent relief pool.

Most RANs reported facing a range of challenges relating to cross-cultural environments. These included differences in language, social norms and gender roles, disparity in religious and spiritual practices, and contested values and beliefs relating to health and illness. There was considerable discussion about feeling caught between western nursing practices and prevailing cultural

Table 1
Summary of occupational stress interventions.

Proposed Intervention Remote context	Implemented by Jan 2015 yes/no
Emotional demands	
Improve education and orientation of RANs	Yes, except for agency staff
Reduce orientation burnout	High staff turnover has prevented this from happening
Social issues	
Introduce internet connection in all accommodation	No
Staffing issues	
Extra positions created to reduce single nurse posts	Yes
Increase permanent relief staff	No
Increase number of RANs	There has been some increase
Increase of Aboriginal staff employed	A number of additional Aboriginal community workers have been employed
Increase employment and training of ancillary staff including admin, cleaners and drivers	Yes
Increase relief staff by increasing own casual pool	No
Identify relief position numbers	No
Advertising RAN campaign in Alice Springs	No
Inter-cultural factors	
Increase orientation and education of RANs on cultural issues	Yes
Isolation	
Internet connection in all accommodation	No
Equipment and infrastructure	
Improve management by employing an equipment manager	Yes
Improve feedback about minor new works by introducing feedback system	Yes
Improve ability of clinics to purchase minor items easily by introducing credit cards	Yes
Ensure prompt evacuations by re tender of air-medical contract (top end)	Yes
Introduce tracking system for repairs	No
Ensure loan equipment same standard as clinic equipment	No
Investigate travelling teams of plumber and electrician	No
Area service managers to review system of repairs for each area	No
Increase number of vehicles to ensure every community has two	Ongoing due to funding implications
Introduce standard fit out of ambulances (Top End)	No
Increase accommodation	No
Lobby for additional accommodation	On-going
Increase cleanliness of clinics and accommodation with a major clean once a year by visiting teams	No
RANs, visitors to pay a bond or charged a cleaning fee if accommodation left in unacceptable condition	No
Health centre managers to monitor condition of accommodation	No
Workload and Responsibilities and expectations	
Responsibilities and expectations	
Introduce career pathway for RANs, allowing some to be learners	Yes, Level 3 positions established
Strengthen pathways program (education program for RANS) or create a new program	No
Establish a steering group to drive the strengthening program	No
Introduce more on-site education	No
Employ additional remote educators	Yes
Increase number of RANs having a period of one to several weeks in Royal Darwin Hospital for upskilling (Top End)	No
Ensure appropriate orientation of all RANs and reduce orientation burnout among staff by:	
- introducing buddying system for all new RANs (when possible)	No
- investigating online modules through Australian Nursing Federation (ANF), Remote Area Health Corp (RAHC), Centre for Remote Health (CRH), CRANAplus	Yes
- investigating the possibility of a virtual clinic	Investigated but no funding available
- develop orientation information for Remote Health website	Yes
- redevelop orientation package	yes
Workload	
Increase coordination of visiting teams to reduce workload	Yes
Increase training on NTDH&F electronic systems to reduce workload on filling in forms	Yes
Increase employment and training of ancillary staff including administration, cleaners and drivers	No
Increase number of RANs	Increasing
Support	
Improve orientation and education	Yes, except for agency staff
Increase number of remote educators	Yes
On-call	
Increase staff numbers to reduce the frequency of on-call for all staff members	Gradual
Management	
Establish education requirements for managers, linked to career pathway	No
Health centre managers to undertake graduate study	No
Create scholarships x 5 offered to health centre managers	No
Increase information from exit interviews received by management team	No
Increase the number of RANs completing exit interviews	No
Introduce feedback system for management by distributing employee opinion survey	No
Violence and safety concerns	
Workplace violence	
Improve on-call systems	Yes
Improve understanding and reporting of vicarious trauma, PTSD for health centre managers and RANs by providing education	No

Table 1 (*Continued*)

Safety concerns	
Area service managers to undertake a review of security and report to OH&S	No
Reintroduce managing aggression and risk management as part of orientation	Yes
Improve safety while on-call by:	
- installation of phone systems in all clinics	Ongoing
- Improve OH&S by introducing OH&S committee, with a senior manager on committee	No
- Introduce Risk Man in reporting of critical incidents	Yes
- Increase use of escorts for on-call at night	No

HLRG, high level reference group; RANs, remote area nurses; ANF, Australian Nursing Federation; RAHC, Remote Area Health Corp; CRH, Centre for Remote Health; CRANA*plus*, Council of Remote Area Nurses of Australia plus; DoH&F, Department of Health and Families; OH&S, occupational health and safety; PTSD, post-traumatic stress disorder; TE, Top End.

practices. The interventions suggested were increased orientation and education of RANs on cultural issues.

The difficulties with infrastructure and equipment and in particular, with maintenance, caused a great deal of frustration among RANs and health centre managers. The vast distances contributed greatly to the difficulties and expense in getting equipment and infrastructure repaired. To improve the management of equipment, RANs proposed to employ an equipment manager, to introduce a tracking system for repairs, and to make loan equipment the same standard and model as clinic equipment. RANs also recommended that all health centres have a minimum of two vehicles. The lack of accommodation in many communities was identified as limiting the number of on-site staff, visiting teams and the ability of health centres to take students. It was also agreed that accommodation needed to be increased.

3.1.2. Workload and scope of practice

The nature of nursing practice in remote areas is unique and has implications for the level of responsibilities and expectations of the community and the employers, workload, difficulties with support, and the on-call that RANs are required to do. There was a commonly held view among RANs that the remote communities and health services have unrealistic expectations that cannot be met. This is often exacerbated by the advanced practice role that RANs are required to perform without adequate professional preparation.

These responsibilities and expectations were linked to the lack of orientation and inadequate education for the advanced practice roles required in remote communities. Suggested interventions included the introduction of more on-site educators and encouraging RANs to have a training period in the local hospital for up-skilling.

Lack of orientation was a key issue related to responsibilities and expectations. Only 65% of RANs in the NT received an orientation to their position, and for those that did, less than half thought it was adequate (Lenthall, Wakerman, Dollard et al., 2011). The 'frontline' nature of remote area health work and the lack of resident medical and allied health practitioners dictate that nurses are subject to greater workloads (Lenthall, Wakerman, Dollard et al., 2011). Nearly all workshop participants reported feeling overwhelmed by the volume of work they were expected to do. Participants reported that the on-call requirements and the frequent turnover of staff exacerbated this situation. The main intervention included increased staff, in particular increased Aboriginal staff, in all areas of the remote health service.

Another major workload issue identified by RANs and health centre manager work groups was the workload created by "fly in/fly out" visiting teams. Remote communities may be served by specialist outreach teams such as cardiology and obstetrics, as well as visiting teams such as midwifery, child health, rheumatic heart disease and external organisations such as the Fred Hollows Foundation. There was little coordination of team visits, with some arriving without notice and two or more arriving at the same time.

Workgroups suggested that visiting teams: (1) be part of the expansion of the clinic team; (2) work with the clinic team on matters that the clinic team identify; (3) schedule a set number of visits per year; (4) do not join the doctor's charter plane visit as the doctor's clinic is already busy; (5) ask health centre managers when is a convenient time to visit; (6) do not bring additional people without checking with the health centre managers; (7) have protocols for visiting teams established in each district; and (8) have calendars that have been negotiated sent to the health centre managers for agreement.

3.1.3. Poor management

RANs and health centre managers identified poor management as a key issue. Nearly all RANs reported difficulties with middle or senior management. Many felt unsupported by managers and they felt that some managers had a poor understanding of their roles as RANs. They perceived that this was worse the further managers were from the 'grass roots'. Members of the implementation committee and the high level reference group assessed that at times the complaints about management were not legitimate. They perceived that management was an easy target for unhappy RANs. However, all participants agreed that education requirements should be established for managers, and these requirements should be linked to career pathways.

3.1.4. Violence and safety concerns

Violence and safety concerns were strongly linked. Many of the safety concerns were related to violence within the community or towards RANs. In the workgroups there were marked differences in participants' concerns about workplace violence. While some, particularly those who had experienced personal violence, were very concerned, others did not consider workplace violence an issue at all. Interventions included reducing single nurse clinics, introducing on-call phone systems and increasing the use of drivers on call-outs after hours. It was also agreed to improve understanding and reporting of violent incidents by providing health centre managers and RANs with education on vicarious trauma and post-traumatic stress disorder.

3.2. Priorities

The workgroups and implementation committee in Central Australia and the Top End were asked to prioritise the occupational stress interventions. In Central Australia, the five highest priorities in order were: (1) permanent relief staff; (2) improved education of RANs, including adequate orientation for all staff; (3) a minimum of two vehicles at each community; (4) employment of an equipment manager; and (5) increased staff, especially Aboriginal staff at clinic level. The Top End workgroups and implementation committee agreed on six priorities: (1) adequate staff; (2) a second vehicle in each community with standard basic fit out of ambulances; (3) increased RAN accommodation; (4) increased permanent relief

pool; (5) improved education for RANs; and (6) internet access in all accommodation.

3.3. Implementation of occupational stress interventions

Some interventions were implemented, however many were not. These are summarised in Table 1.

3.4. Evaluation

3.4.1. Process evaluation

Feedback provided in the post-workshop evaluation surveys was mainly positive. Participants found the RAN and health centre manager workgroups and implementation committee meetings generally interesting and engaging, the facilitators effective, and participants thought that their input was valued. In contrast, the results from the process evaluation obtained from survey two, completed some months after the end of the PAR/organisational development process, were far less positive. The majority 26 of 37 respondents (71%) felt that little or no trust had been built during the process, and 29 of 37 (79%) respondents that the action plans of the interventions had not been substantially.

3.4.2. Outcome evaluation

There was a significant improvement in difficulties with infrastructure and equipment in the Top End. There was an improvement in lack of support in CA, however there was also an improvement in support in the control group. There were no other significant improvements among the other variables (See Table 2).

There were also no improvements over the previous 12 months in the areas of workload, education, staff relief and management for CA or for the Top End (see Table 3).

4. Discussion

Numerous practical and thoughtful interventions relating to staffing, training, safety and improving infrastructure and equipment were identified. The emphasis as suggested by the literature focused on developing primary, secondary and tertiary occupational stress interventions. However, the implementation of many of these interventions proved to be extremely difficult. There were five main reasons identified by the research team for the non-implementation. Firstly, there were a number of contextual issues that were impossible to influence or overcome. The high turnover of RANs and the difficulty in recruitment of RANs results in a vicious cycle. It is difficult to reduce occupational stress and implement many of the interventions with such an unstable workforce. Second, there was a lack of funding to resource the implementation of interventions. Whilst service partners contributed in cash and in kind to the study, there was no additional funding by the service provider to implement the recommended interventions. Third, lower standards of equipment and infrastructure in remote communities are often accepted by health services, staff and community members. Maintenance of buildings and equipment was often below the acceptable national standards in remote communities.

Fourth, there were interagency complexities. Some of the buildings and accommodation are owned by departments other than the NTDH&F and other departments have authority over various pieces of equipment. Implementing some of the interventions required agreement by multiple departments and proved extremely complex. Lastly, the implementation period of 12 months was probably too short to implement many of the interventions. It is important to note that implementation has continued after the end of the study and it is hoped more occupational stress interventions will be implemented in the future.

Violence and safety of RANs remains a major issue. This was tragically highlighted by the murder of a RAN in South Australia at Easter 2016. The death has prompted many RANs and organisations to examine their safety practices. In particular there has been a strong movement to limit RANs attending call outs at night on their own, consistent, sadly, with the 'Back from the Edge' study findings and recommendations. The NT Department of Health report on remote area nurse safety (Northern Territory Department of Health, 2016), frequently cited papers from the BFTE study and recommendations that were not previously implemented including;

- that after hours call-outs in remote communities are undertaken by a team of two people (Recommendation 1a);
- minimum orientation requirements are mandated for all remote Primary Health Care staff (Recommendation 5a);
- consideration is given to providing standardised internet access in nurses houses to facilitate access to on-line resources including procedures, protocols and learning modules (Recommendation 5c);
- re-introduction of a relieving staff pool (Recommendation 6);
- strengthen 'Back on Track', Indigenous employment initiatives across all employment categories for Aboriginal staff (Recommendation 8) (Northern Territory Department of Health, 2016).

It is expected that the implementation of many of the occupational stress interventions, will be ongoing for some years.

5. Limitations

Prior to and during the research period, there was considerable turmoil within remote Aboriginal communities and health services in the NT. There was a great deal of political action including the Australian Government Intervention into the NT, a controversial package of changes to welfare provision, law enforcement, land tenure and other measures, introduced by the Australian federal government under John Howard, beginning in 2007 and continuing throughout the project. In 2009, when the workgroups of RANs and health centre managers were being conducted, there was an outbreak of H1N1 influenza (human swine flu). Considerable resources within the NTDH&F were redirected to managing this outbreak. This greatly increased the workload of RANs, health centre managers, and managers within the health department and made it more difficult for some units to attend the workshops.

6. Conclusions

The 'Back from the edge: reducing occupational stress among RANs in the Northern Territory' study used an adapted PAR/OD model to develop and implement occupational stress interventions. The process evaluations of the workshops were very positive but the outcome evaluations showed low implementation of interventions and low impact on sources and outcomes of occupational stress. Nevertheless, the new knowledge created by the study is useful. The issues relating to creating a stable, well-educated and well-managed workforce with the physical resources required to fulfil a challenging job remain outstanding and will not go away without further intervention.

The new knowledge generated in this study should inform policy and practice with respect to service delivery in remote areas. There are implications in regard to service models. These need to be adequately resourced, staff better prepared and services, especially visiting services, better co-ordinated. To maximise effectiveness, there needs to be greater interdepartmental co-ordination or rationalisation in order to ensure the timely maintenance of essential equipment and infrastructure.

Table 2
NT samples and control group outcome measures.

		Top End		CA		Control (other RNs in v remote communities outside the NT	
		Survey 1	Survey 2	Survey 1	Survey 2	Survey 1	Survey 2
System capacity	**Total system capacity**						
	Number	32	43	30	25	59	83
	Mean	26.13	24.63	22.23	22.52	25.61	25.12
	SD	7.49	9.63	8.27	6.97	9.29	9.12
	Sig.	$p = 0.81$ n/s		$p = 0.41$ n/s		$p = 0.66$ n/s	
	Flexible and adaptable culture, Subscale of system capacity						
	Number	35	60	27	26	61	89
	Mean	5.09	4.6	4.19	4.08	4.72	4.31
	SD	1.77	1.65	1.78	1.65	2.00	2.12
	Sig.	$p = 0.18$ n/s		$p = 0.35$ n/s		$p = 0.68$ n/s	
	Consultation and preparation, Subscale of system capacity						
	Number	34	44	26	26	61	84
	Mean	8.82	8.91	7.73	8.50	9.11	8.90
	SD	2.68	3.48	3.04	2.45	3.05	3.58
	Sig.	$p = 0.94$ n/s		$p = 0.15$ n/s		$p = 0.90$ n/s	
	Communication, Subscale of system capacity						
	Number	35	57	27	27	63	89
	Mean	4.14	4.42	3.70	4.07	3.98	4.04
	SD	1.96	1.86	1.92	1.86	1.96	1.92
	Sig.	$p = 0.36$ n/s		$p = 0.44$ n/s		$p = 0.43$ n/s	
	Psychosocial safety climate, Subscale of system capacity						
	Number	33	45	31	27	62	88
	Mean	12.09	11.27	10.71	9.78	12.02	12.15
	SD	3.52	4.21	3.68	2.89	3.70	3.87
	Sig.	$p = 0.83$ n/s		$p = 0.11$ n/s		$p = 0.64$ n/s	
Positive outcomes	**Work engagement**						
	Number	33	55	27	26	60	88
	Mean	4.61	4.54	4.42	4.56	4.35	4.41
	SD	1.07	1.03	1.24	0.98	1.22	1.18
	Sig.	$p = 0.76$ n/s		$p = 0.65$ n/s		$p = 0.77$ n/s	
	Job satisfaction						
	Number	35	53	27	26	61	85
	Mean	4.29	4.02	4.26	4.31	4.16	4.19
	SD	1.07	1.41	1.40	1.26	0.97	1.16
	Sig.	$p = 0.34$ n/s		$p = 0.89$ n/s		$p = 0.87$ n/s	
Job resources	**Supervision**						
	Number	34	57	26	26	63	87
	Mean	11.62	10.79	9.38	9.38	9.03	9.47
	SD	3.59	4.13	3.32	5.05	3.94	4.66
	Sig.	$p = 0.33$ n/s		No difference		$p = 0.92$ n/s	
	Opportunities for professional development						
	Number	34	57	27	27	63	89
	Mean	9.29	9.25	9.56	8.70	8.41	8.13
	SD	3.09	3.62	3.79	3.21	4.30	4.03
	Sig.	$p = 0.83$ n/s		$p = 0.64$ n/s		$p = 0.92$ n/s	
	Job control						
	Number	33	52	23	25	61	88
	Mean	21.55	24.19	24.83	23.76	21.05	22.82
	SD	8.07	8.31	9.25	9.12	8.20	8.47
	Sig.	$p = 0.15$ n/s		$p = 0.47$ n/s		$p =$ n/s	
Negative outcomes	**Psychological distress, GHQ**						
	Number	34	57	27	26	62	88
	Mean	13.58	13.12	11.56	12.58	12.08	11.56
	SD	7.08	6.94	5.27	6.23	5.31	5.10
	Sig.	$p = 0.81$ n/s		$p = 0.52$ n/s		$p = 0.54$ n/s	
	Emotional exhaustion						
	Number	33	62	29	27	63	88
	Mean	20.82	20.01	25.33	20.59	21.42	20.11
	SD	14.02	12.76	14.66	11.97	12.62	12.13
	Sig.	$p = 0.78$ n/s		$p = 0.19$ n/s		$p = 0.60$ n/s	
	PTSD Symptoms, Post traumatic stress disorder checklist (PCL)						
	Number	34	56	26	27	60	87
	Mean	10.41	11.34	11.19	9.89	10.72	9.77
	SD	11.74	12.17	10.54	11.00	10.71	12.01
	Sig.	$p = 0.72$ n/s		$p = 0.66$ n/s		$p = 0.62$ n/s	
RAN Stress Scale	**Witnessed Violence**						
	Number	33	55	27	27	60	86
	Mean	11.64	14.75	9.63	10.93	9.77	9.88
	SD	6.10	8.91	6.81	5.87	6.44	6.33
	Sig.	$p = 0.98$ n/s		$p = 0.23$ n/s		$p = 0.44$ n/s	
	Personal Violence						
	Number	34	53	27	26	60	88
	Mean	5.85	7.15	5.44	5.81	5.95	6.38
	SD	4.55	5.31	4.49	4.35	4.98	5.16

Table 2 (*Continued*)

	Top End		CA		Control (other RNs in v remote communities outside the NT	
	Survey 1	Survey 2	Survey 1	Survey 2	Survey 1	Survey 2
Sig.	$p = 0.24$ n/s		$p = 0.44$ n/s		$p = 0.61$ n/s	
Emotional demands						
Number	34	57	27	27	63	89
Mean	8.32	7.88	7.78	7.63	7.19	7.01
SD	2.04	3.02	3.25	2.63	2.79	2.66
Sig.	$p = 0.45$ n/s		$p = 0.14$ n/s		$p = 0.69$ n/s	
Poor management						
Number	34	43	24	24	57	86
Mean	13.32	16.05	14.67	16.50	14.77	15.74
SD	9.86	11.63	10.60	10.09	10.75	12.46
Sig.	$p = 0.28$ n/s		$p = 0.54$ n/s		$p = 0.34$ n/s	
Staffing difficulties						
Number	35	44	26	26	60	86
Mean	13.03	13.27	11.77	12.38	8.55	11.92
SD	6.61	7.44	7.24	6.71	6.41	9.23
Sig.	$p = 0.76$ n/s		$p = 0.35$ n/s		**$p = 0.016$***	
On-call						
Number	35	45	27	26	60	85
Mean	15.63	17.69	18.19	17.73	16.93	18.47
SD	4.26	6.44	3.10	7.81	8.21	7.12
Sig.	$p = 0.11$ n/s		$p = 1$ n/s		$p = 0.75$ n/s	
Workload						
Number	35	45	26	27	61	89
Mean	21.54	20.76	22.00	19.37	18.54	17.63
SD	5.39	6.82	5.96	7.76	7.21	6.18
Sig.	$p = 0.58$ n/s		$p = 0.16$ n/s		$p = 0.41$ n/s	
Responsibilities and Expectations						
Number	35	45	27	26	60	85
Mean	25.11	25.69	21.78	22.08	23.92	21.93
SD	9.50	12.59	11.56	10.33	11.55	11.81
Sig.	$p = 0.97$ n/s		$p = 0.29$ n/s		$p = 0.46$ n/s	
Safety concerns						
Number	35	44	27	26	63	88
Mean	9.23	11.59	9.22	9.12	10.81	10.68
SD	7.20	8.65	7.38	6.41	8.69	7.52
Sig.	$p = 0.199$ n/s		$p = 0.24$ n/s		$p = 0.11$ n/s	
Social issues						
Number	35	44	27	27	63	87
Mean	9.37	8.48	9.37	10.11	10.52	9.02
SD	6.20	6.56	5.20	5.67	6.43	6.16
Sig.	$p = 0.54$ n/s		$p = 0.67$ n/s		$p = 0.15$ n/s	
Isolation						
Number	35	45	27	27	63	88
Mean	9.14	10.69	11.07	11.15	10.84	12.08
SD	5.87	6.24	6.20	6.35	6.18	6.59
Sig.	$p = 0.26$ n/s		$p = 0.55$ n/s		$p = 0.25$ n/s	
Intercultural factors						
Number	35	45	26	27	62	89
Mean	10.86	10.33	12.27	10.19	7.24	8.36
SD	4.09	5.70	6.00	5.02	6.34	6.38
Sig.	$p = 0.98$ n/s		$p = 0.18$ n/s		$p = 0.29$ n/s	
Culture shock						
Number	35	45	26	27	62	89
Mean	8.03	6.56	10.35	7.41	6.58	6.27
SD	5.47	6.23	7.41	6.01	6.99	6.65
Sig.	$p = 0.27$ n/s		$p = 0.12$ n/s		$p = 0.33$ n/s	
Lack of Support						
Number	33	44	26	27	63	88
Mean	15.94	13.64	17.50	12.22	17.54	13.51
SD	6.87	6.97	6.59	5.33	6.49	7.52
Sig.	$p = 0.15$ n/s		**$p = 0.0023$****		**$p = 0.0008$****	
Infrastructure and equipment difficulties						
Number	35	45	27	26	59	88
Mean	20.66	25.58	25.07	22.15	17.90	19.20
SD	8.33	11.28	8.53	8.53	9.14	11.06
Sig.	**$p = 0.034$***		$p = 0.22$ n/s		$p = 0.46$ n/s	

n/s, not significant, *significant, **highly significant.
CA, Central Australia.
Higher numbers = higher levels.

Table 3
Changes in previous 12 months.

Changes in last 12 months		All Very Remote			Very Remote NT only		
		Freq	Valid%	Cum%	Freq	Valid%	Cum%
To workload?	Not at all	137	31.9	31.9	35	25.9	25.9
	Not very much	146	34.0	66.0	37	27.4	53.3
	To some extent	75	17.5	83.4	29	21.5	74.8
	Somewhat	53	12.4	95.8	21	15.6	90.4
	To a large extent	18	4.2	100.0	13	9.6	100.0
	Total	429	100.0		135	100.0	
To education of nurses?	Not at all	98	22.8	22.8	16	11.9	11.9
	Not very much	116	27.0	49.8	26	19.4	31.3
	To some extent	120	27.9	77.7	40	29.9	61.2
	Somewhat	70	16.3	94.0	31	23.1	84.3
	To a large extent	26	6.0	100.0	21	15.7	100.0
	Total	430	100.0	100.0	134	100.0	100.0

Appropriate training for managers, especially clinicians who become managers, is a perennial, inadequately addressed problem in remote and rural areas.

With financial and other pressures to attain formal accreditation of primary care services in both urban and remote settings, the tolerance of below standard infrastructure and practice will (and should) by necessity diminish. This study has generated and applied new knowledge about mitigating and preventing stress in the remote nursing workforce that should contribute to the reduction of costs to organisations and employees of occupational stress. The study provides a partial but substantial blueprint for improving the quality of service provision. Importantly, the priorities have been thoughtfully identified by staff at the challenging front-line of remote service delivery.

Authors' contributions

Sue Lenthall was responsible for the conceptual development of the paper, the data analyses and the writing of the paper. John Wakerman, Sandra Dunn, Sabina Knight, Tess Opie and Greg Rickard contributed to the conceptual development of the study and paper, data analysis and commented on drafts. Maureen Dollard assisted with the application of the theoretical framework and the data analyses. She also provided feedback on drafts of the paper. Martha MacLeod commented on drafts of the paper.

Acknowledgements

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