Coping and adjustment in New Zealand Police staff 12-18 months after the Canterbury earthquakes: A directed qualitative content analysis

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Following a significant earthquake police are a large first responder group involved in victim recovery, civil emergencies and community support. They are also exposed to the everyday work and non-work related disruptions associated with the disaster. Conservation of resources (COR) theory offers a framework for understanding longer-term health outcomes associated with disasters in this group. Using a mixed methods approach we surveyed coping resources and psychological health outcomes in police (sworn and non-sworn) working during the 2010-2011 earthquakes in Christchurch (New Zealand). Free text responses (n = 322) from the quantitative survey were subject to a directed qualitative content analysis. Initial data coding used four categories derived from COR theory then inductively grouped into a typology of losses and gains. Resource losses included on-going issues with insurance providers, damage and threat of loss to home, financial insecurity, and loss of social connectedness, lack of employer recognition and job threat. Resource gains included enhanced self-efficacy, posttraumatic growth and pride in contributing as police during the critical periods. COR theory was conceptually a good fit for the data, and underscored the dominance of disaster-associated day-to-day resource losses. Implications for staff support and wellbeing, and foci of future welfare interventions are considered.

In the early hours of September 4th 2010 the first of a series of significant earthquakes struck the Canterbury region of New Zealand (NZ). This first earthquake measured 7.1 on the Richter scale, causing widespread damage to land and buildings across the region but no loss of life. Over the ensuing 15 months a further eight significant earthquake events followed among more than 10,000 aftershocks (GNS Science, 2013). The most destructive was the February 22nd (2011) shallow earthquake (6.3 on the Richter scale) with an epicentre close to the Christchurch Central Business District (CBD), the largest city (population 376,000) in the Canterbury region (population 520,000) (Statistics New Zealand, 2013). This earthquake struck at 12.51pm causing widespread damage to buildings and infrastructure. Unlike the September earthquake, 185 people were killed and more than 8,000 injuries were registered with the Accident Compensation Corporation (ACC), NZ's primary injury insurance and compensation provider (ACC, 2011). It has been estimated that 10,000 homes have since been demolished and more than 100,000 homes were damaged although considered repairable.

Approximately 95% of New Zealanders have home insurance (Morrall, 2012) from which a levy is collected from an entity called the Earthquake Commission (EQC) creating a government-regulated natural disaster fund (EQC, 1993). To determine the outcome (repairs or otherwise) for properties, homeowners have had to negotiate claim settlements with both EQC and their private insurance companies. This has become a prolonged and stressful process for many homeowners, given problems achieving resolution of claims because processes between these insurance providers have differed.

Police as First Responders

Disaster first responders include a wide range of both professional and non-professional groups. Professional groups reflect those occupations whose members are regularly put in harm's way and provide critical services following a civil disaster. Prevention and intervention strategies for adverse psychological outcomes in disaster first responders (police or otherwise) remains an underdeveloped field of research, which in part may explain a recent description of best prevention and intervention practice as still very controversial (Kleim & Westphal, 2011). More research into specific first responder populations and their respective peri- and post-disaster roles may help understand risk factors and in turn opportunities for primary prevention, screening and intervention.

The rescue response to the February earthquake was extensive involving multiple agencies co-ordinated by Fire and Police Services. International first responder teams supplemented these groups, though Canterbury Police were among the largest of the first responder groups taking a leadership role and coordinating additional personnel from other districts and countries (New Zealand Police, 2013a, 2013b). Alongside regular duties, police provided security cordons, organised evacuations and search and rescue, worked in victim identification teams, provided missing persons/family liaison support, and organised media briefings.

As an occupational group, police are frequently exposed to high stress, and internationally have high rates of medical retirement due to mental health problems (Peñalba, McGuire,

& Leite, 2009). Disaster research investigating psychological outcomes of first responder groups often focuses on negative emotional consequences resulting from exposures to traumatic experiences, high work demands, working with evacuees, and separation from home and loved ones (Benedek, Fullerton, & Ursano, 2007; Haugen, Evces, & Weiss, 2012). In a disaster, local first responders can be personally affected and experience damage to their own homes/communities, loss and injury to themselves, family members, friends and colleagues. There is limited research assessing the impact of these non-work related repercussions on local first responder groups. Such effects might be important to consider in the prediction of psychological adjustment in first responder groups such as police following large-scale disasters.

Conservation of Resources Theory

Various models conceptualise psychological distress following disasters (Sumer, Karanci, Berument, & Gunes, 2005). One model potentially capturing the complexities of disaster outcomes in first responders who both work and live in affected communities is the Conservation of Resources (COR) model (Hobfoll, 1989, 2001, 2012). It is a theory capable of drawing together resource losses and gains across both work and non-work contexts. The COR model assumes that people are motivated to obtain, retain and protect valued resources to successfully cope with stress. Resources consist of material elements or objects such as housing and possessions, along with personal characteristics (e.g., optimism, self-efficacy), energy resources (time, effort, knowledge) and conditions (employment roles, interpersonal relationships). The model suggests stress occurs when an individual's resources are threatened or lost and/or individuals fail to gain sufficient resources following investment. Loss or threat to personal resources is assumed to lead to negative emotional and physical health outcomes.

The COR model has been investigated in relation to understanding coping and adjustment following disasters, whether natural such as earthquakes (Sattler et al., 2006; Sumer, et al., 2005), hurricanes (Ehrlich et al., 2010), floods and drought (e.g. Zamani, Gorgievski-Duijvesteijn, & Zarafshani, 2006); or 'man made' such as war and terrorism (Heath, Hall, Russ, Canetti, & Hobfoll, 2012); or technological (Ehrlich, et al., 2010). Such research provides support for the COR model regarding: (1) relationships between resource losses and symptoms of anxiety, depression and post-traumatic stress disorder (PTSD), (2) the mitigating but less salient effects of resource gains, and (3) the effects of resource loss spirals (continued loss of resources and the impacts of secondary stressors). Following an earthquake, losses may occur through damage to possessions and places of work, disruption to social systems, inability to maintain and gain resources (Ehrlich, et al., 2010), and through impact on personal characteristics such as perceived control and self-efficacy. Resource gains might also be experienced such as a positive sense of well-being associated with being in a helping role and seeing oneself cope (Zoellner, Rabe, Karl, & Maercker, 2008). However COR theory predicts that resource gains, while mitigating, are less salient in the face of large-scale resource losses.

In the present study psychological outcomes for police as first responders were examined 12-18 months after the Canterbury earthquake series began because people may delay acknowledging their distress for lengthy periods post-disaster, despite experiencing reasonably significant problems (Mitchell, Griffin, Stewart, & Loba, 2004). The COR model was considered a useful framework in which longer term outcomes associated with both work and non-work stressors might be understood in local first responder police. This is because local police as first responders are exposed to potential disaster effects both in their work roles and in their roles as members of the affected wider community. The following questions were considered:

1. Using the COR model as a guiding framework, what are the work- and non-work earthquake-related consequences for local police first responders 12-18 months after the Canterbury earthquakes began?

2. What are the implications for staff training and wellbeing, particularly the curricula of future preventative interventions?

METHOD

Design and setting

This was a mixed methods study surveying coping resources and psychological health outcomes in police working during the 2010-2011 earthquakes in Christchurch, New Zealand. This paper reports the findings of the directed qualitative content analysis of free text responses that followed the main questionnaire (see Surgenor, Snell and Dorahy, now in press, for a fuller description of the study methods).

Participants

Potential participants were recruited from a list of Canterbury sworn and non-sworn staff provided by New Zealand Police. The primary inclusion criterion was being active police (sworn or non-sworn) residing in the Canterbury area on 22 February 2011. Exclusion criteria were staff not on active duty on/around 22 February 2011 (e.g., sick-leave) or otherwise excluded as required by Police National Headquarters (e.g., personnel in high security roles). An email invitation to participate in the study was circulated internally by Police National Headquarters to all eligible staff. Face-to-face data collection was considered untenable due to many participants being displaced from their usual buildings. Thus, internet-based data collection was a practical solution, and one used before in disaster research (Schlenger et al., 2002).

We received 786 (75%) responses from 1,048 police staff residing in Canterbury on 22 February 2011. Of these, 18 were identified as duplicates and removed; the actual participation rate was 72% (n = 768). Free text responses were provided by 324 (45%). More males than females responded (males 72.7%) and mean age of respondents was 46.2 years (SD 7.59). The only significant difference between the free text responders and wider sample was being sworn staff ($p < 0.05$); sworn staff members were more likely

to have provided free text responses. Free text responses were received from staff across all earthquake related work categories (public cordon duties, search and rescue, victim recovery and identification, family liaison, media work, communications, logistics and missing person's assignments). The gender and ratio of sworn/non-sworn staff of recruited participants very closely mirrors the New Zealand Police overall (Human Rights Commission, 2012). Ethical approval was obtained from both the research institution's Ethics Committee and the New Zealand Police.

Data collection and measures

An internet-based survey was circulated using Survey Monkey® (www.surveymonkey.com). For security reasons, the survey link was distributed via the police email network, although all content identified the email as a research study independent of the police. Completed surveys were accessed only by the research institution.

Along with standard demographic questions (gender, age, ethnicity, education level), participants were asked to describe their usual work location (categorised as central CBD, suburban, rural or other), sworn status, and whether they held a specialist emergency role (e.g., search and rescue, armed offenders squad) in addition to their normal duties. They were also asked to indicate from a list which first-responder roles they took part in (list ascertained from human resources and welfare staff) in response to the 22 February 2011 earthquake and how many (0-4) of the four major earthquakes (September, 2010; February, 2011; June, 2011; December, 2011) they worked in as part of the police emergency response. Measures included in the survey assessed coping resources and styles, distress, and general health outcomes (see Surgenor et al., in press). After these an open-ended statement ("Is there anything else (positive or negative) you would like to tell us") was included to elicit free text information from respondents.

Data analysis

A directed qualitative content analysis was used to identify, classify and code themes and patterns within the free text data (Hsieh & Shannon, 2005). Directed content analysis differs from more conventional qualitative methods in that it is more structured and involves both deductive and inductive approaches to the analysis (Pisarik, Rowell, & Currie, 2013). The researcher is guided by an a priori theory or framework or previous research in order to promote more detailed description of a phenomenon or validate or extend a theory.

The COR model was used to identify key concepts for the initial coding categories and then operational definitions for each category were determined by the research team using COR theory resource categories. Free text responses were coded by two members of the team (DS, LS) using the predetermined codes, and any data that could not be coded was examined to determine if this represented new categories or subcategories of existing codes (Braun & Clarke, 2006; Hsieh & Shannon, 2005). Member checking occurred by informal presentation to a police management team. Data are presented descriptively by code with their associated exemplars, and frequency of codes was also calculated (Hsieh & Shannon, 2005).

RESULTS

Data were coded, using the four COR resource categories (object, condition, energy and personal characteristic resources), as either a resource loss or gain. Table 1 shows the response frequencies and exemplar quotes from participants. The most salient patterns that emerged from the analyses were losses in terms of object and condition resources, and resource gains with respect to personal characteristics.

Object Resource Loss

Object resources were defined as physical items of value due to their utility, rarity, or symbolism (e.g., housing, transportation). Object resource loss was often mentioned underscoring the importance of object resources, such as financial and housing security. The impact of living in a damaged home without any certainty around decisions on insurance outcomes and EQC claims, the loss of financial security as a result of the insurance process, and the loss of valued possessions were common issues. For example:

Our house is a write-off, despite being still able to live in it and we are still in absolute limbo over timelines and also cash shortfalls when the rebuild comes. House is cold as gaps under doors need to be plugged by towels [Case 250].

We still have a lot of stress coming at some point because we have a medium to significant amount of damage to our home including foundations and roof which will need fixing and will require us to move out to alternative accommodation for many months at some point in the future. This will be very stressful for us [Case 26].

Also losing two pets as a result of these quakes - which I don't think was mentioned in the survey. Very disheartening losing family, pets and a city [Case 36].

Condition Resources

Condition resources (states of being) were defined as resources to the extent they are valued and sought after. Following our initial analysis, it appeared helpful to consider work and non-work condition resources as subcategories (see Table 1). Examples of non-work condition resources included non-work roles (wife, partner, parent, social relationships) that are important in increasing stress resistance capacity. Work condition resources included work roles and status, collegial relationships at work, feeling part of a work team, employer (e.g. supervisors, managers) recognition and acknowledgement, feeling safe at work, and experiencing organisational support. Free text responses included both condition resource losses and gains although losses were more prominent.

a) Non-work condition resource losses

Loss of connection with family and friends as well as relational impacts, fears and concerns for partner and children were prominent in responses. For example:

I have lost touch with a number of people who moved away after the

quakes … I feel a loss of connection and feel like I am just drifting away. The place I knew and served seems like it is no longer there, and the tie I felt is gone [Case 73].

I have a child at school and I often feel concerned when I am at work that if another significant event occurred I may not be able to get to him. This scares me and I think about this quite often [Case 28].

My wife is worn out from the continuing fights with all the various agencies; she has aged 10 years in two. My kids are still afraid of our house and won't go upstairs alone [Case 114].

b) Non-work condition resource gains

There were also reflections of strengthened ties with family and community and the positive impact this had on coping and resilience. For example:

I am much closer to my community and know my neighbours a lot better as well as the local business people and information centre. I fully intend to stay in this area and keep my current home after it is repaired [Case 26].

The main positive thing that happened as a direct result of the earthquakes was that family, friends and neighbours pulled together to help each other [Case 47].

I have found that people are better communicators since the earthquakes. People are more willing to talk about their situations. The earthquakes showed everyone involved what is actually important in each of our lives [Case 97].

c) Work condition resource losses

Many comments reflected concerns about lack of both support and recognition for going above and beyond at the time of the earthquakes as well as the impact of organisational restructuring when staff were already feeling overwhelmed and under pressure. For a few, distrust in the building in which they worked throughout the critical period suggested a lack of concern for personal safety by the organisation. For example:

> I am extremely disappointed with the lack of recognition from the department for the 'above and beyond' work completed on that day. It was like a war zone, the injuries and fatalities were horrific [Case 56].
>
> My attitude towards work is not so positive as I feel we should have been removed from the Central Police Station until they were absolutely certain it was safe … [Case 27].

Some staff also reflected on a sense of isolation that resulted from being Police, such that access to usual sources of social support was unavailable:

> However, a lot of the experience has to be kept private, simply because I can't burden anyone with the 'gory' details [Case 52].

d) Work condition resource gains

Positive acts of leadership and support were perceived as helpful:

The ring arounds [phone calls to staff] were nice to know that management were thinking about staff and I found this a comfort [Case 105]. Many staff acknowledged a sense of pride in their role as Police at the time of the disaster, as well as commitment and connectedness to being Police:

The theme was one of pride with being a member of police as to the way we had responded [Case 245].

Energy Resources

Energy resources were defined as resources that are valued because they lead to acquiring other resources (such as time, money, knowledge, help seeking [i.e. seeking information/ knowledge/ support to enable better coping]). A small number of respondents commented on the importance of information in regard to managing anxiety about safety:

> I was very disappointed with the way the situation with Christchurch Central [police station] was handled and the initial lack of information about the building safety…this caused me and many others a large amount of stress [Case 165].

Some respondents reflected on knowledge gain including how helpful access to professional support was for them in regard to gaining knowledge and skills to cope better with the situation they were in:

> Following the earthquake, I sought assistance with a psychologist for my PTSD. I have found that it has helped me cope and recognise my symptoms and how best to relieve them [Case 300].

Personal Characteristic Resources

Personal characteristic resources are traits that help with stress resiliency such as general personal orientation toward the world, beliefs, self-efficacy, and locus of control. A small number of respondents reported coping less well than they expected and some acknowledged both difficulty returning to normal work and an element of cynicism in their approach to the work following the earthquakes.

> I was able to do my job, but away from my desk I broke down and felt weak and along with people losing lives and homes this affected me a great deal - had to take time off work [Case 37].
>
> When I came back to 'normal' duties after the earthquake I had difficulty relating to people and their problems. I was very critical of what I perceived to be their petty or minor problems after the enormity of what I had dealt with and seen [Case 52].

However more prominent were perceptions of having coped well, better than expected, with associated enhancement of self-esteem.

> The earthquakes have provided me with the most rewarding experiences in my professional work. All the training I've had has actually been put to the test and I feel that I met the challenges of the day(s) really well [Case 4].

Other Responses

A small proportion of responses (7.6%) could not be categorised into one of these COR resource categories and these were responses that reflected psychological and health consequences of earthquake trauma exposure such as anxiety, depression, fatigue, and vulnerability to illness since the earthquakes. These are shown in Table 1.

Table 1: Category and subcategory exemplar quotes and frequencies (606 items coded)

COR§ Category	Subcategory	Loss/Gain	Frequency (%)	Example/supporting data
Object Resources		Loss	21.0	At the end of the day we are nearly two years down the track. I have a home that is broken and needs to be rebuilt. …we cannot move forward. We don't know what will happen with insurance, land testing, lending, resale etc. [Case 114]. Some of us are still living in red-zoned housing[1] 2 years on fighting Insurance companies with no light at the end of the tunnel as to where we are going to live [Case 138]. Damage to home, damage to work place - entire disruption that has been outside of my control [Case 115]. My house was wrecked, my wife and kids weren't coping with living in a wrecked and leaking house. My area was also wrecked along with the roads, the liquefaction, the liquefaction dust, earthquake damage to our land, our house, our belongings and our motor vehicle [Case 122]. Many aspects of the lives of me and my family are on hold because our house is significantly damaged, i.e. part of the house foundations have moved away from the rest of the house and the external bricks are cracked [Case 63].
Object Resources		Gain	2.6	We have ended up selling our house and are now renting in case we decide we want to make a new start somewhere else. This has in effect made us more relaxed [Case 32].
Condition Resources	Non-Work[2]	Loss	14.2	I have lost touch with a number of people who moved away after the quakes that is sad. I feel sad that a lot of people have been badly hurt through it all and I know nothing of their stories. It saddens me I have seen, to have seen so much history just disappear, I feel a loss of connection and feel like I am just drifting away. The place I knew and served seems like it is no longer there, and the tie I felt is gone [Case 73].
				MY RELATIONSHIP HAS BASICALLY BEEN TAKEN TO ITS LIMIT [Case 50]. (Capital letters used by respondent). Partner of ten years left me and took our two year old daughter with her while I was working 16 hour days [Case 142].
Condition Resources	Non-Work[2]	Gain	9.6	The most major positive is that I now have a stronger marriage and family as we pulled together when we really needed to and the knowledge that we can rely on each other during times like this is priceless!!!! [Case 147] (Exclamation marks included by respondent). The feeling of community increased significantly as a result of the earthquakes. This related to neighbours, friends, family, colleagues and the relationship between police and the public. While this feeling has diminished, there is still a sense that we have all gone through something together [Case 146].
Condition Resources	Work[3]	Loss	14.0	…there seems to be no recognition of some of the work some of us had to do. This in itself would help heal and put things behind us. It's as if the door hasn't closed [Case 138]. I believe that front line Police have been extremely under-appreciated as a result of the earthquakes… I know of lots of cops who will never ever get recognised for what they did during the earthquakes and the effort that they put in to help others. [Case 24]. We are currently being affected by major restructuring and job uncertainty. This along with the loss of our home, ongoing issues with EQC, Insurance, poor work environment and permanent injury and ongoing issues to a family member makes life more than challenging. There appears little respite. I am seeking help...[Case 41].

Condition Resources	Work[3]	Gain	6.9	I feel immensely grateful that as a police officer, I was allowed to be involved in the searching process during the early stages after Feb 22. So many people wanted to be actively involved but weren't allowed access. We were, and I feel very privileged for that [Case 146]. Even though not directly involved in search/rescue etc, and doing rather "un heroic" jobs, felt good to be part of the company we work for [Case 68]. It was an honour to work with the families [of victims] and this in turn helped with my coping mechanisms, even though I also lost a cousin on 22/02/2011 [Case 219].
Energy Resources		Loss	2.3	Made lots of rash and quick decisions following earthquakes in regard to property and listening to media that the quakes were going to continue for 30 years which made me think real estate wouldn't be worth much which is now the opposite with what's occurring in the rebuild [Case 170].
Energy Resources		Gain	3.3	Learning experience not only from professional, working perspective but involvement in an historic, life changing event in the history of Canterbury. Gained a greater overview of how different areas and organisations operate, respond and prepare [Case 243].
Personal Characteristics Resources		Loss	5.8	I had always wondered how I would be in an emergency. I always assumed I would be a tower of strength, be proactive and help others....I was able to do my job, but away from my desk I broke down and felt weak & along with people losing lives and homes this affected me a great deal - had to take time off work [Case 37]. It would be [a] fair comment that I do not necessarily like my hardened attitude I do not like reflecting on the EQs I like to move on with life, I cannot tolerate repeated reliving of the events [Case 713].
Personal Characteristics Resources		Gain	12.7	The way I personally responded and my decision making during all the earthquakes. Learnt about myself. E.g. Ability to handle a huge workload [Case 127]. I have learned that I can cope under life and death stress. My home and family are more prepared for another civil defence emergency [Case 145].
Other[4]			7.6	I am still very "jumpy" around loud noises, bangs or shakes… [Case 1]. …diagnosed with PTSD. Working through this daily, some are good (haven't had many great ones yet), some are really bad and low. On the whole I feel I'm slowly getting better; but it does feel like it takes an awfully long time [Case 49]. I seem to have had negative impacts on my physical health, getting sick (cold/flu symptoms) substantially more often and for longer periods [Case 109].

Note:

§ Hobfoll (1989, 2001).

1.Red-zoned houses are those deemed damaged beyond repair (or on unsafe land unable to be repaired). Red zone homeowners were offered a Government payout for purchase of their homes.

2. Non-work condition resources included social relationships outside work such as being married, with a partner, being a parent, connection to community (friends, neighbours).

3. Work condition resources included seniority at work, work role, collegial relationships, recognition and support from superiors, feeling safe at work.

4. Other: items that could not be coded into one of the four resource categories but reflected emotional consequences of the traumatic experience such as still feeling anxious and jumpy, depressed, fatigued.

DISCUSSION

The Canterbury earthquakes provided a unique opportunity for extending research exploring psychological outcomes following natural disasters. The combination of the context (nature of disaster, sociocultural context), target population (police first responders), and the impact of resource losses and gains described by COR theory have not been examined previously. This directed qualitative content analysis examined the fit between free text responses from a survey of police first responders and Hobfoll's COR theory of stress.

The COR model was conceptually a good fit for the data, underscoring the dominance of on-going disaster associated day-to-day losses (work and non-work) in police. Object and condition resource losses including the impacts of living in earthquake damaged homes, uncertainty regarding timelines and outcomes of insurance claim processes, loss of financial security and widespread social impacts of the earthquakes predominated. The social aspect included impacts on connectedness to home, work and community, lack of employer recognition for going above and beyond, and job threat due to restructuring plans. Gains were also evident, such as enhanced self-efficacy and pride in contributing as police during the critical periods.

The Context Revisited – the earthquakes

First, the series of Canterbury earthquakes and significant aftershocks continued for more than 15 months and included 60 events ≥ magnitude 5 on the Richter scale. We are not aware of any disaster outcome research that has considered impacts of such prolonged seismic activity on a first responder community, with the duration of this exposure seriously testing resilience. Second, earthquake events typically occur without warning, are usually followed by a series of aftershocks and might not have a low point where people feel the worst is over as may be the case for other acute natural disasters such as floods, fires and hurricanes (Zamani, et al., 2006). The extended nature of the Canterbury experience might produce similar outcomes to those following slower onset disaster scenarios, where in addition to obvious immediate effects; impacts may also evolve slowly, becoming more uncertain and ambiguous over time (Zamani, et al., 2006). These effects are potentially exacerbated by the sociocultural context. The dual nature of New Zealand property insurance (EQC and private companies) has had unintended effects of conflicting insurance processes without resolution or certainty of outcomes for home owners.

The prolonged nature of stress reported by many respondents was consistent with the salience of resource losses predicted by COR theory and resource loss spirals (Hobfoll, 2001, 2012). Loss spirals occur as a result of initial resource losses increasing vulnerability to ongoing resource loss and the impacts of secondary stressors. Resource loss spirals have been investigated in high demand situations such as large-scale disasters (Ehrlich, et al., 2010; Heath, et al., 2012). This body of research shows that persistent stressors such as repeated earthquakes contribute to spiralling resource losses and exacerbated chronic stress effects (see especially Sattler, et al., 2006). In our study respondent comments suggested loss spirals associated with continuing earthquakes, lack of future certainty, in combination with additional pressures such as perceived ill-judged timing of restructuring of jobs while individuals still reported feeling overwhelmed by earthquake sequelae.

Previous research has also examined associations between components of the COR model and psychological outcomes after disasters in general community samples. The salience of resource loss in the prediction of psychological outcomes is supported but varying patterns of resource category losses emerge. For example, Ehrlich et al. (2010) examined loss of resources as predictors of post-partum depression in 208 women following Hurricane Katrina, measuring outcome (depression) at 6 and 12 months post-partum. Loss of psychosocial resources (COR condition and personal characteristic resources) was associated with development of depression. Sattler et al. (2006) examined the relationship between resource loss and psychological outcomes (acute stress disorder [ASD], PTSD, depression) in college students (n = 253) and a community sample (n = 83) four and seven weeks following the 2001 El Salvador earthquakes. In students, personal characteristic, condition and energy resource losses contributed to ASD and depression while object and personal characteristic resource losses were more salient for the community sample. In our study object and condition resource losses dominated and while no relationships between outcomes can be discussed, the potential impact of contextual factors (nature of sample and location) are underscored.

The Context Revisited – Police as First Responders

The potential negative emotional consequences of disaster work such as ASD, PTSD, depression as well as subclinical emotional symptoms and behaviours have been the subject of extensive research (Benedek, et al., 2007). However, usually only a small percentage of people going through a disaster will experience serious mental health problems (Benedek, et al., 2007). For some, a positive sense of well-being sometimes referred to as post-traumatic growth is reported (Zoellner, et al., 2008), albeit the concept of post-traumatic growth itself is contentious in some quarters (Aspinwell & Tedeschi, 2010; Coyne & Tennen, 2010). Existing research also suggests benefit-finding may be influenced by cultural and social contexts. For example, studies in Western cultures tend to find greater willingness of participants to endorse and discuss positive emotions when compared with participants in Eastern cultures (Cummins, 2013). Such findings emphasise the importance of the sociocultural context that is arguably at the centre of COR theory, setting it apart from other stress models and theoretical frameworks (Hobfoll, 2001).

Disaster effects do not occur in a vacuum. In our study respondents highlighted the salience of both work (supervisor and colleague relationships, wider organisational factors) and non-work resource losses. The COR framework offers a coherent way of understanding and examining the relative contributions of these

various resources, the associations of these with psychological outcomes, and opportunities for intervention. Consistent with Cummins (2013), many respondents in our study offered positive comments about their ability to cope with the disaster, skills and knowledge gained through the experience, and reflected on their commitment to and sense of pride in their police role, particularly at the time of and following the February earthquake. In COR theory, these responses reflect personal characteristic resource gains. Further examination of these gains and their associations with coping and adjustment in first responders will assist development of interventions to enhance the psychological robustness or resilience of these groups.

Implications for Future Research

Our results suggested that the COR theoretical framework might provide a useful means of understanding psychological outcomes following large-scale disasters in first responders who themselves have experienced disaster associated resource losses and gains. There is a growing body of evidence supporting COR theory assumptions in general disaster populations however there is also some research that suggests first responders might respond differently to disaster experiences (Benedek, et al., 2007). Consistent with this, our study suggests that compared with the general population, these groups might experience a differing pattern of resource losses and gains necessitating modified intervention approaches. Research is required to examine these theoretical possibilities. In addition, our cross-sectional descriptive study suggests future research might focus on risk for development of resource loss spirals leading to chronic stress outcomes, using longitudinal designs with follow-up extending beyond the early weeks after a disaster.

Implications for Practice

Based on the body of research examining COR theory in disaster-exposed populations, the model has utility as a coherent framework to guide intervention. It seems that attending to patterns of resource loss and gain and focus on restoring psychosocial (personal characteristics, condition and energy resources) and object resources could lead to improved outcomes. Thus interventions might need to target individual, family, organisation and community contexts although separating these parts from the whole may limit both predictive and intervention capacity (Hobfoll, 2001, 2012). In addition COR theory predicts that resource losses following traumatic events occur quickly and cumulatively and halting or reversing loss spirals early should be an important focus (Heath, et al., 2012). COR theory suggests that organisations focus on development of 'resource caravans' (Hobfoll, 2012, p 118), where resources are supplied, protected, shared, fostered and pooled within an organisation. Such an approach redirects the focus to the social climate of the organisation rather than externalising failures by blaming employees or groups of employees.

Limitations

This is a descriptive study using directed content analysis to code a large number of free text responses at the end of a formal survey of police first responders following a series of major earthquakes in New Zealand. Although due caution is needed in generalising these findings beyond the study context and sample, the findings provide helpful leads for future research and will assist the research team interpret results from the wider quantitative analyses.

The structure of the survey and use of directed content analysis may have influenced the findings. First, the open ended question at the end of the survey followed structured questionnaires asking about coping resources and styles, distress, and general health outcomes. These preceding items may have led respondents to focus on these aspects. Second, directed content analysis involves the researcher approaching the data from an informed a priori position with an increased likelihood that evidence will be found to support the chosen theoretical framework (Hsieh & Shannon, 2005). An overemphasis on the theoretical framework might direct the researchers gaze and thus increase risk that important contextual information is overlooked. In order to increase the trustworthiness of the approach to data analysis a second researcher tested the definitions of codes and care was taken to refine Hobfoll's resource definitions as clearly as possible. Member checking by referring back to the affected community (police) was also undertaken in order to consider the relevance of the findings.

Finally, three of the four researchers in the team also experienced the earthquakes themselves and work as clinicians treating distressed members of the affected broader community of Christchurch. This positioning of the researchers may have introduced bias and so the inclusion of an additional co-author (JHS) who does not live in the affected community and did not experience the earthquakes was considered important to verify the data analysis.

Conclusions

This exploratory directed qualitative content analysis applied a theoretical model of stress to understanding psychological adjustment and consequences in a first responder cohort following the New Zealand earthquakes of 2010-2011. Participant free text responses reflected the importance over time of both work and non-work pressures for first responders who themselves were exposed to the earthquakes. The COR framework was conceptually a good fit for the data and the insights regarding patterns of resource losses perceived by participants provides useful leads for future hypothesis-driven research. The COR model has potential to contribute usefully to the iterative process of theory development and refinement of individual and organisational interventions for disaster first responder populations.

Acknowledgments

We would like to thank Canterbury Police management and staff for their willingness to support and participate in this study.

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