Mental health problems among search and rescue workers deployed in the Haïti earthquake 2010: A pre–post comparison

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ABSTRACT

Search and rescue workers play an important role in rescuing trapped disaster victims. However, it is unclear whether they are at risk for post-disaster mental health problems. For this purpose we prospectively examined pre- and post-deployment health among Dutch search and rescue workers (USAR NL) deployed in the devastating Haiti earthquake disaster (2010). The evening before departure (T1, response = 100%) and 3 months post-deployment (T2, response = 91%), Search and rescue workers were administered standardized questionnaires assessing health (SCL-90-R, RAND-36), including use of substances and mental health services utilization ($N = 51$). At T2 event-related PTSD-symptoms (IES) and coping self-efficacy (CSE), and experiences during and after deployment were examined. At both surveys health problems were almost absent and no significant increases in health problems and use of substances were found. PTSD-symptomatology was very low and coping self-efficacy rather high. Protective factors such as good team functioning, recognition and job satisfaction were clearly present, while risk factors such as sustained injuries or death of a co-worker were absent. Findings suggest that post-disaster health problems may (partly) be prevented by enhancing or restoring protective factors.

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1. Introduction

It is quite common today that countries have specialized and trained urban search and rescue forces. As part of an integrated disaster response, these forces can act within a very short period of time. The primary focus of these teams is to find and rescue victims trapped after a disaster including safely digging victims out of collapsed buildings, and giving medical care to victims during and after a rescue. In general, forces end their search and rescue work within approximately 10 days. The chance that trapped (and perhaps injured) victims could survive without water and food declines dramatically after 5–10 days.

Of course, urban search and rescue work – especially when trapped victims are rescued – can be very satisfying and rewarding. On the other hand, as shown in the review of McCaslin et al. (2009), critical exposure characteristics such as facing injured and dead adults and children, the smell of the deceased, destroyed areas, danger, unsuccessful operations, and emotions of survivors (such as anxiety, grief, helplessness, anger) may put workers at risk for event-related mental health problems such as posttraumatic stress disorder

(PTSD). However, research has demonstrated that prevalence of posttraumatic distress and PTSD varies substantially across disasters and background of rescue workers. For example, in the study of Gabriel et al. (2007), 2 months after the Madrid bombing, 1.3% of the police officers of an elite corps met the criteria of PTSD. Four months after the Ash Wednesday bushfire, 31% of the volunteer firefighters qualified for a diagnosis of PTSD (McFarlane and Papay, 1992).

Almost all disaster studies focused on rescue workers have been conducted after the disaster. Therefore it is unclear to what extent mental health problems (MHP) can be attributed to disaster-exposure or were already present before the event. For example, after the Oklahoma bombing, North et al. (2002) found that the rate of post-event non-alcohol disorders among firefighters was four times higher in those with pre-disaster psychopathology (43% versus 11%). Similar findings were reported after the 9/11 terrorist attacks. Deployed canine and rescue handlers with a history of mental illness compared to colleagues without such a history reported more symptoms of depression and psychological distress, and they more often met criteria for a current disorder (Alvarez and Hunt, 2005). However, both of these studies were based on possibly biased, retrospectively collected data on previous MHP. Remarkably, one prospective study with pre–post measures among police officers (body handlers)

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found that affected officers had less anxiety 3 months post-disaster, while depression symptoms remained stable (Alexander and Wells, 1991). Further support for the importance of pre-event functioning is found in several prospective studies on critical incidents among officers (van der Velden et al., 2010). In addition, especially research among police officers has shown that organizational stressors are more likely sources of adverse psychological reactions, including PTSD, than critical incidents (Brown et al., 1999; Hartley et al., 2007; Huddleston et al., 2007; Liberman et al., 2002; van der Velden et al., 2010; Wang et al., 2010). To what extent specialized and trained urban search and rescue forces are at risk for post-disaster MHP remains unclear.

Because disasters occur suddenly, the relatively few prospective disaster studies that did conduct pre–post comparisons had this unique opportunity because researchers were already conducting a study when the disaster unexpectedly took place. To obtain reliable data about (mental) health before the disaster, an assessment just before rescue workers are deployed to the disaster site is optimal for this type of prospective investigation. With this goal in mind, we designed the present study. In cooperation with the Dutch Urban Search and Rescue (USAR NL), study materials (letters, questionnaires, informed consent forms) were prepared in case of a new disaster where USAR NL would be deployed. According to plan, in case of a new disaster before departure, workers would complete questionnaires and informed consent forms. Follow-up was scheduled approximately 3 months post-deployment. This pre-designed study was started soon after the first reports of the devastating Haïti earthquake (January 12, 2010).

2. Method

2.1. Background

On January 12, 2010, around 5 P.M. local time Haiti, one of the poorest countries in the world (WHO, 2005) with a record of violence caused by the absence of State service (IRC, 2009), was struck by a massive earthquake registering 7.0 on the Richter scale. Many (governmental) buildings, the airport and houses collapsed, and the infrastructure was destroyed. Early after the disaster it was estimated that at least between 50,000 and 120,000 people had died and many more were (severely) injured. It was within this context that the Search and Rescue Netherlands (USAR NL) team was activated.

2.2. Procedure and sample

A USAR NL team ($N = 60$) consisting of firefighters, police officers with trained dogs, nurses, a surgeon, and communication personnel were deployed to Haïti. On January 13, 2010, at 3:15 P.M. local time, USAR NL formed the national operational team. Members were requested to gather after 6:00 P.M. on a military base nearby Eindhoven Airport, The Netherlands, to be able to fly to Haiti the same night (Dutch military personnel who provide support to USAR NL were excluded from this study). During the evening, all team members were medically examined before departure (i.e. general medical status by a physician (TE) of USAR NL). To prevent malaria, all received a packet of Malarone. Participants were briefed about the disaster and operation. In this period, all members ($N = 56$) were informed (orally and by letter) about the aim of this research project and asked to participate (T1). They all gave their written informed consent and then filled in a paper-and-pencil questionnaire (response = 100%).

On January 14 at 10:15 A.M local time, USAR NL departed. USAR NL first arrived at the Dominican Republic, because the airport of Haiti could not handle large numbers of (heavy) airplanes. Finally they flew to Haiti via Curaçao and arrived on January 15 at Port-au-Prince. They left Haiti on January 22, stayed for 2 days in Curaçao for debriefing aimed at the search and rescue work during the week in Haiti (not psychological debriefing) and prepared to fly back. One employee of the Institute for Psychotrauma (PL) joined the team at Curaçao to advise the team leaders in case of any psychosocial issues that needed care. They finally arrived at Eindhoven Airport on January 24. About 1 week later, all members received a letter from the IVP (PL) with his phone number in case a member wanted additional advice or help. In the following weeks all members were personally contacted, with the aim of (a.) providing them with support and advice about resuming their normal work and daily living, and (b.) in a non-intrusive way monitoring their post-event health ("watchful waiting"). Importantly, nobody needed help because of any consequences related to disaster exposure.

Three months after deployment, all respondents at T1 ($N = 56$) were invited to participate in a follow-up (T2). After a few weeks a reminder was sent. In total, 51 members gave their written informed consent and returned the completed questionnaires (response = 91%).

2.3. Measures

2.3.1. Demographics

Demographic information concerning gender, age, years of USAR NL membership, search and rescue work during previous disasters, such as Morocco (2004) and Pakistan (2005), was obtained at T1.

2.3.2. Health

We administered the Symptom Checklist 90 (SCL-90-R; Arrindell and Ettema, 1986; Derogatis, 1983) at T1 and T2 to examine symptoms during the past 7 days, such as depression and anxiety. The Dutch norm tables for males and females were used to identify respondents with severe symptoms (i.e. with high or very high scores). The validity and reliability of the Dutch SCL-90-R have proved to be satisfactory (Arrindell and Ettema, 1986). We did not compute Cronbach's alpha for the SCL-90-R scales in this sample because of skewednesss of the data, caused by extremely low scores (see results; Dunlap et al., 1994). However, previous trauma research among rescue workers showed that the SCL-90-R scales had high internal consistencies, i.e. high Cronbach's alpha coefficients (van der Velden et al., 2006a, 2008, 2010). Disaster-related PTSD symptoms (i.e., intrusions and avoidance reactions) at T2 were assessed using the 15-item Impact of Event Scale (IES; 0 = not at all, 1 = seldom, 3 = sometimes, 5 = often; Horowitz et al., 1979). The validity and reliability of the Dutch IES have proved to be satisfactory (van der Ploeg et al., 2004). The IES assesses symptoms during the past 7 days (Cronbach's alpha = 0.77). In addition, we asked at T1 and T2 whether or not participants were currently using physician-prescribed medicines for depressive feelings and/or emotional/sleeping problems. At both waves one standardized question from the RAND-36 (Aaronson et al., 1998) was used to examine perceived general health (1 = excellent, to 5 = bad).

2.3.3. Substance use

Smoking at T1 and T2 was assessed using the Dutch Local and National Public Health Monitor (GGD, 2003). For this study we focused on current smoking (Do you ever smoke? (1 = yes, 2 = no, but in the past; 3 = no, I never smoked)) and amount of cigarettes. Alcohol consumption at T1 and T2 was examined using the Dutch Monitoring Project on Risk Factors for Chronic Diseases (Blokstra et al., 1998). In the present study we focus on general alcohol use per day assessed as the amount of glasses of beer, wine or hard liquor, during the past month.

2.3.4. Mental health services (MHS) utilization

Current use of MHS (local MHS, private psychiatrist, psychologist or psychotherapist; yes/no) was assessed at T1 and T2 (van der Velden et al., 2006b). In addition at both waves we examined so-called "un-met needs" (i.e., whether or not participants felt they needed professional help due to psychological problems, tension or the use of alcohol or drugs, but did not consult a physician or other professional helper; Bijl and Ravelli, 1998). Respondents answered yes or no at T1: during past 12 months, and at T2 since deployment in Haïti (see Table 2).

2.3.5. Experiences with the disaster and aftermath

For the present study we developed a 24 item questionnaire aimed at the work and experiences in Haïti (13 items) and the aftermath (11 items), using 5-point Likert scales (1 = not, to 5 = much). They covered topics such as exposure (e.g., view/smell deceased, being threatened) and organizational stressors (e.g., job satisfaction, team functioning), social support (e.g., rewarding, support), and problems resuming work once home (see Table 2).

2.3.6. Coping self-efficacy

A 24-item version of the coping self-efficacy list (CSE; Benight et al., 2004; Hyre et al., 2008) was administered at T2. The CSE assesses to what extent participants feel they are capable of handling 20 situations since the Haiti earthquake, such as coping with emotions since their search and rescue work, accepting what has happened, and concentrating on work and being effective. All items have 7-point Likert scales (1 = I am not at all capable, to 7 = I am totally capable, Cronbach's alpha = 0.94).

2.3.7. Data analyses

Due to the non-normality of our data, pre–post comparisons were conducted using non-parametric chi-square tests (McNemar–Bowker and test for marginal homogeneity) and Wilcoxon's z. For correlation analyses we used the non-parametric Spearman's correlation.

3. Results

3.1. Health

The large majority of participants were males (92.2%) with a mean age of 44.7 years (S.D. = 6.4). The sample consisted of police officers ($n = 11$), firefighters ($n = 35$), ambulance personnel ($n = 4$) and one surgeon. Almost 3/4 of the sample had been members of USAR NL for 2 years or longer. In total, 45.1% were deployed to previous disasters.