



Prevalence and predictors of posttraumatic stress disorder, anxiety, depression, and burnout in Pakistani earthquake recovery workers

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ABSTRACT

Past research has shown a substantial prevalence of emotional disorders in professionals involved in rescue and/or relief operations following natural disasters, including earthquakes. However, no published study to date has investigated whether disaster rehabilitation and reconstruction workers involved in later phases of the earthquake response are also affected by emotional problems. A nearly complete sample of earthquake rehabilitation and reconstruction workers ($N=267$) involved in the response to the 2005 earthquake in Northern Pakistan filled in a set of self-report questionnaires assessing emotional problems and predictor variables approximately 24 months after the earthquake. Most participants had experienced the disaster themselves and suffered from a number of stressors during and shortly after the acute earthquake phase. A substantial subgroup of participants reported clinically relevant levels of emotional disorders, especially earthquake-related posttraumatic stress disorder (42.6%), as well as depression and anxiety (approx. 20%). Levels of burnout were low. Symptom levels of posttraumatic stress disorder were associated with the severity of the earthquake experience, past traumas, work-related stressors, low social support, and female gender. The results document a high prevalence of emotional problems in earthquake rehabilitation and recovery workers.

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1. Introduction

Natural disasters, such as earthquakes, floods, or hurricanes are prevalent traumatic events around the world. Earlier research has shown that in a substantial subgroup of survivors, natural disasters can lead to emotional disorders, including posttraumatic stress disorder (PTSD), other anxiety disorders, and depression (Norris et al., 2002; Neria et al., 2008). There is increasing recognition that not only the general population but also rescue workers engaged in disaster relief are at risk of developing disaster-related emotional problems (Benedek et al., 2007). This group typically includes not only professional fire fighters, military personnel, police officers, search-and-rescue teams, and medical personnel, but also volunteer rescue workers without any formal training. Earlier studies have estimated the prevalence of PTSD in earthquake relief personnel to lie between 20% and 25% (Chang et al., 2003; Guo et al., 2004; Ozen and Sir, 2004; Hagh-Shenas et al., 2005), with one study even reporting a prevalence as high as 43% (Soldatos et al., 2006). As only a subgroup of disaster relief workers develops PTSD, it appears important to identify risk factors or predictors of this disorder. However, only few studies to date have investigated predictors of PTSD in earthquake relief workers

and few of these variables have been replicated. Preliminary evidence suggests that PTSD is related to being a volunteer rescuer (vs. a professional) (Guo et al., 2004; Hagh-Shenas et al., 2005), having a longer job experience (among professional rescuers) (Chang et al., 2003, 2008), high levels of identification with the dead and their families (Cetin et al., 2005), use of avoidant coping strategies (Chang et al., 2003), and high levels of anxiety sensitivity (Hagh-Shenas et al., 2005).

It is important to note, however, that all published studies to date have focused on individuals involved in the immediate response to disasters during the emergency relief phase. To our knowledge, it has not been investigated yet whether disaster recovery workers deployed later-on for rehabilitation and reconstruction also show a higher risk of emotional disorders. After large-scale natural disasters, such as earthquakes, a large number of professional rehabilitation and reconstruction workers are deployed to disaster regions for months or even years. Investigating the prevalence of emotional problems in this group appears relevant for a number of reasons. First, a substantial subgroup of professionals involved in disaster recovery can be expected to have already lived in or close to the affected region when the disaster struck, which may have led to disaster-related PTSD in some individuals. Second, as part of their job, disaster rehabilitation and reconstruction workers are exposed to the consequences the disaster had on the population. In addition to being exposed to destroyed houses, destroyed infrastructure, injured people, and dead bodies, disaster recovery workers often also have to repeatedly listen

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to disaster survivors' stories of their experience of the disaster and its impact on their lives, which may lead to secondary traumatization (Boscarino et al., 2004; Byrne et al., 2006). Finally, disaster recovery workers often experience high levels of work stress, such as high work load, long working hours, and being away from home, which may increase risk for depression or burnout. Burnout is a response to chronic work stress characterized by a number of symptoms; however, 'emotional exhaustion', defined as the draining of emotional resources, is usually regarded as the key factor (Maslach and Jackson, 1986; Schaufeli et al., 2001).

The current study aimed to investigate the prevalence and predictors of PTSD, depression, anxiety, and burnout in rehabilitation and reconstruction workers following the 2005 earthquake in Northern Pakistan. On 8 October 2005 at 8:50 am local time, an earthquake of magnitude $M_w = 7.6$ hit the North-West Frontier Province (NWFP) and Azad Jammu and Kashmir (AJK) regions of Pakistan. It was one of the most deadly earthquakes in the recent history of the subcontinent, which left more than 73,500 people dead, half a million homeless, and countless without livelihoods. In January 2006, the Earthquake Rehabilitation and Reconstruction Program (ERRP) funded by the World Bank was launched with the aim to reconstruct housing and the community physical infrastructure as well as support social mobilization, which was supplemented by funds from the International Fund for Agriculture (IFAD) and the German Reconstruction Credit Institute (KfW). The Pakistan Poverty Alleviation Fund (PPAF) was selected as an implementing partner for the ERRP. The current study was conducted among employees of this organization.

2. Methods

2.1. Participants

Data were collected on a nearly complete sample of earthquake recovery workers employed by the Pakistan Poverty Alleviation Fund's (PPAF) Earthquake Rehabilitation and Reconstruction Program. All 278 individuals in active duty at the time of the study were approached and invited for participation. The response rate was 96%, resulting in a final sample of $N = 267$ individuals (for demographic data see Table 1). Participants fell into three groups differing in professional background and tasks. The largest group comprised social organizers involved in activities such as mobilizing the population affected by the earthquake, ensuring a consultative and participatory process during reconstruction, rebuilding of community-based institutions, and organizing trainings. The second group consisted of engineers and technical reconstruction workers directly involved in reconstruction of housing and rehabilitation of the community physical infrastructure, whereas the final group comprised individuals involved in coordination and/or supervision.

2.2. Instruments

When selecting the measures for the current study, we could only identify two validated instruments in Urdu that were suitable to assess the variables of interest. These were the *Pakistan Anxiety and Depression Questionnaire* and the *Bradford Somatic Inventory*. For the remaining variables, validated English questionnaires were selected and translated into Urdu by one of the authors (SR), who is a bilingual psychologist. The equivalence of the English- and Urdu-language versions was established through blind back-translation by a bilingual psychiatrist.

2.2.1. Assessment of symptom severities

The severity of symptoms of PTSD, anxiety, depression, and burnout was assessed with four self-report questionnaires.

The *Impact of Event Scale-Revised* (IES-R) (Weiss and Marmar, 1996) was used to assess symptom levels of PTSD. The IES-R is a widely used self-report questionnaire with established psychometric properties (Creamer et al., 2003) (α in this sample = 0.94). Participants are asked to rate 22 items covering the symptom clusters intrusion, avoidance, and hyperarousal on a scale from '0' (not at all) to '4' (extremely). A cutoff of 33 on the total score has been shown to possess a good diagnostic efficiency for a diagnosis of PTSD (Creamer et al., 2003). Therefore, this cutoff was used to establish a probable diagnosis of PTSD in the current study.

Symptom levels of anxiety and depression were measured with the *Pakistan Anxiety and Depression Questionnaire* (PADQ), a culturally sensitive screening instrument for anxiety and depression symptoms specifically developed for a Pakistani population (Mumford et al., 2005). The questionnaire consists of two subscales, a mixed anxiety and depression scale (15 items; α in this sample = 0.68) and a depression scale (15 items; α in this sample = 0.82). All items are answered with 'yes'

Table 1
Sample characteristics.

		N (%)	M (S.D.)
Age			28.93 (5.48)
Sex	Male	224 (83.9%)	
	Female	43 (16.1%)	
Ethnic background ^a	Hazarawal	106 (42.1%)	
	Pakhtun	47 (18.7%)	
	Kashmiri	77 (30.6%)	
	Punjabi	15 (6%)	
	Other	7 (2.8%)	
Marital status ^b	Single/divorced	152 (57.8%)	
	Married	111 (42.2%)	
Current living arrangements ^c	Alone	7 (2.7%)	
	With family	177 (67.8%)	
	With friends	21 (8%)	
	Working hostel	56 (21.5%)	
Children ^d	Yes	72 (27.3%)	
	No	192 (72.7%)	
Religious group ^e	Muslim/Suni	243 (93.1%)	
	Muslim/Shia	18 (6.9%)	
Qualifications ^e	No degree	7 (3.1%)	
	Bachelor	93 (40.8%)	
	Master	116 (50.9%)	
	Post-master	7 (3.1%)	
	Other	5 (2.2%)	
Main duties ^f	Social organization	133 (51.4%)	
	Engineering/reconstruction	80 (30.9%)	
	Coordination/supervision	46 (17.8%)	
Earthquake region	Abbotabad	17 (6.4%)	
	Batagram	25 (9.4%)	
	Battal	38 (14.2%)	
	Ellahi	13 (4.9%)	
	Bagh IR	30 (11.2%)	
	Bagh NRSP	60 (22.5%)	
	Rawalakot	31 (11.6%)	
	Shakeyari	53 (19.9%)	

^a $n = 252$.

^b $n = 263$.

^c $n = 261$.

^d $n = 264$.

^e $n = 228$.

^f $n = 259$.

(scored as '1') or 'no' (scored as '0'). For both subscales, sum scores of 6 or more are indicative of a probable anxiety or depressive disorder (Mumford et al., 2005).

Furthermore, the 21-item-version of the *Bradford Somatic Inventory* (BSI) (Mumford et al., 1991) was used to assess somatic symptoms associated with anxiety and depression. The BSI is a multi-ethnic questionnaire with good psychometric properties in Pakistani samples (Mumford et al., 1991). Participants are asked to rate each item as 'not present during the past month' (scored as '0'), 'present during the past month on less than 15 days' (scored as '1') or 'present during the past month on a total of 15 days' (scored as '2'). Scores above 13 have been shown to reflect clinically relevant symptom levels (Minhas and Nizami, 2006). The internal consistency of the BSI in this study was high ($\alpha = 0.87$).

Finally, levels of burnout were assessed with the *Maslach Burnout Inventory* (MBI) (Maslach and Jackson, 1986). The 22-item questionnaire is the most widely used measure of burnout and has been shown to possess high reliability and validity (Schaufeli et al., 2001). Only the subscale 'emotional exhaustion' was included in the current research as this is usually regarded as the core component of burnout. The scale includes 9 items (α in this sample = 0.74). According to the norms reported in the manual, scores ≥ 27 on the 'emotional exhaustion' scale are indicative of high levels of burnout (Maslach and Jackson, 1986).

2.2.2. Trauma-related measures

The *Trauma Exposure Severity Scale* (TESS) (Elal and Slade, 2005) was used to assess the extent to which participants had been exposed to the earthquake themselves. Participants are asked to first indicate for each of the 24 items whether they have experienced this

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