Research paper

Prevalence and duration of PTSD in survivors 6 years after a natural disaster

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ARTICLE INFO

ABSTRACT

The present study aimed to examine the prevalence of posttraumatic stress disorder (PTSD) in survivors with low levels of risk factors for PTSD. The sample included 142 adults (58% women, 54% university education, 93% employed/students/retired) on vacation in Southeast Asia during the 2004 Indian Ocean disaster. Semi-structured clinical interviews (SCID-I) were performed after 6 years including PTSD, depression, specific phobia, and alcohol abuse. The 6-year prevalence of PTSD was 11.3% and the current prevalence was 4.2%, with onset mainly within 1 month and remission within 3 years post-disaster. Suicidal ideation and comorbidity were common in PTSD cases. Lifetime prevalence of depression was 19%, specific phobia 7%, and alcohol abuse 4%. The findings suggest elevated levels of PTSD but not other disorders as compared with general population samples, but still lower levels than other disaster samples. Despite benign circumstances, however, the course and burden of PTSD were comparable to similar studies.

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1. Introduction

Disasters challenge world societies to prepare for and respond to the needs of scores of victims worldwide. An efficient societal response is based on proper estimates of the incidence of psychological disorder. Numerous studies have assessed the incidence and prevalence of posttraumatic stress disorder (PTSD; American Psychiatric Association, 2000) after disasters (Neria, Nandi, & Galea, 2008), which is a disabling disorder related to high rates of comorbidity and suicidal ideation (Cougle, Resnick, & Kilpatrick, 2009). Yet, despite consistent findings that PTSD is unlikely to remit if persisting beyond 6 years (Green, Lindy, Grace, & Leonard, 1992; Hull, Alexander, & Klein, 2002; North, Oliver, & Pandya, 2012), the overwhelming majority of studies have been conducted within the first 2 years post-disaster (Norris, 2006). Further, extant studies of long-term PTSD concern events that entailed severe secondary and collateral stressors that may exacerbate or prolong the prevalence rates of PTSD (Arnberg, Eriksson, Hultman, & Lundin, 2011; Brewin, Andrews, & Valentine, 2000): for example, substantial loss of property or possessions (Green et al., 1992), prolonged anxiety and fear

because of terrorist attacks (North, Pfefferbaum, Kawasaki, Lee, & Spitznagel, 2011), and unemployment (Bøe, Holgersen, & Holen, 2011; Hull et al., 2002). Severe hardships in the wake of disaster confound estimates of the capacity for a life-threatening experience to produce chronic PTSD (Kessler et al., 2008). Because such collateral stressors are commonplace and because of a lack of long-term studies, there is uncertainty about the toxicity of the qualifying stressor itself, which is the purported causal agent in PTSD.

PTSD, specific phobia, and depression have been found to increase in prevalence after disasters (Norris et al., 2002). Increased alcohol consumption after disasters has also been noted, although recent findings suggest that the onset of alcohol abuse may often precede the disaster exposure (North, Pfefferbaum, et al., 2011). Prevalence estimates of PTSD after natural disasters range from 4 to 60%, with the majority of studies reporting estimates below 30% (Neria et al., 2008).

A major influence on the estimates of PTSD is the severity of the participants' disaster exposure (Basoglu, Kilic, Salcioglu, & Livanou, 2004; Bergh Johannesson et al., 2009). Apart from being a key determinant for PTSD, systematic differences in exposure severity have been pointed out as a potential confounder, explaining the higher rates of psychiatric morbidity after anthropogenic (i.e., disasters where the determinants or agents of the destruction were human-caused) versus natural disasters (Neria et al., 2008; North et al., 2012). Often the survivors' level of exposure is not examined thoroughly in epidemiologic surveys despite that the severity of exposure is crucial in understanding the psychological toxicity of traumatic events (North, Pollio, et al., 2011).

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Further affecting the link between disaster and outcome, centripetal disasters, which are events that strike an extant community of people, may severely disrupt such life domains as housing, occupation, and leisure activities. The event may deplete social resources in the community and hence obstruct social support, which is an important salutogenic factor after disasters (Arnberg, Hultman, Michel, & Lundin, 2012; Kaniasty & Norris, 2009). The nearly ubiquitous presence of secondary or collateral stressors in the aftermath of disasters, especially after centripetal disasters, affects the incidence of PTSD and provides little insight into the potential of the life-threatening event itself to bring about PTSD (Galea et al., 2007; Tracy, Norris, & Galea, 2011). Studies sometimes report an association between post-disaster stressors and PTSD, generally showing a small to moderate positive association (Brewin et al., 2000). Finally, as noted above, the rather short time to follow-up in most epidemiological studies after disasters suggests that current estimates of the total psychological burden in disaster victims fail to represent the long-standing nature PTSD (Arnberg et al., 2011; Green et al., 1992; Norris, 2006).

The present study aims to estimate the prevalence and incidence of PTSD 6 years after the 2004 Indian Ocean earthquake and the resulting tsunamis in a sample of afflicted Swedish tourists who were repatriated shortly after the event. This study is part of a national longitudinal follow-up of Swedish survivors that until now has relied on mail surveys (Bergh Johannesson et al., 2009). Participants' self-report data from surveys of the larger sample were included to characterize cases of PTSD and provide prospective data on associated suicidal ideation. Because of the characteristics of the sample and the event, the study could shed light on the prevalence of PTSD because of the disaster experience itself. In particular, the sample included tourists with high rates of employment and high educational attainment, as well as low levels of pre-disaster morbidity and post-disaster stressors, who were repatriated to unscathed homes after the event.

2. Materials and methods

2.1. Procedure and participants

The Swedish authorities registered all Swedish citizens who were repatriated from destinations in Southeast Asia during the first 3 weeks after the disaster. The 21 Swedish county councils were asked for approval of the inclusion of county inhabitants in the follow-up and 10 agreed ($n = 10,116$). The interviews were conducted 74 months after the disaster with a subsample of the national cohort. The assessments in the national cohort include a mail survey 14 months after the disaster (T1, $n = 4932$; Bergh Johannesson et al., 2009) and two following surveys of the respondents from the first survey: at 37 months (T2, $n = 3457$; Bergh Johannesson, Lundin, Fröjd, Hultman, & Michel, 2011) and 1 month after the interviews (i.e., 75 months after the disaster; T3, $n = 2643$; Bergh Johannesson, Arnberg, & Michel, 2012). A random sample of 200 individuals was selected from respondents at T2 who had provided consent to participate in a telephone interview ($n = 2104$, 61%) and had indicated in the survey at T1 that they were directly exposed to the disaster as described below.

Disaster exposure was established with 30 multiple-choice items included in the survey at T1 about the participants' experiences during and shortly after the event. A set of exposure criteria was selected from the 30 items based on previous analyses of the present sample (Bergh Johannesson et al., 2009). Participants were eligible for inclusion in the present study if they had been caught in or chased by the tsunami or experienced one or more of the following: bereavement of family/relatives, physical injuries to themselves or others, and witnessing distressing

consequences of the disaster (dead bodies, others suffering, or forlorn children). In all, 1684 individuals fulfilled the exposure criteria and agreed to an interview. The participants who consented to the interview were similar in age, gender, and employment status to those who declined (lowest $p = .27$). However, participants who declined to participate reported somewhat higher levels of post-traumatic stress according to the Impact of Event Scale—Revised (IES-R; Weiss, 2004) at T2 ($M_{diff} = 3.65$), $t(3359) = 7.22$, $p < .001$. Of the 200 participants approached for interviews, 27 declined and 31 could not be reached. Completing the interviews was associated with older age ($M_{diff} = 6.2$ years), $t(198) = 2.89$, $p = .004$, but not with other demographic variables or posttraumatic stress (lowest $p = .42$). The study was approved by the Ethical Review Board in Uppsala, Sweden

2.2. Measures

The Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I) was used to assess current and lifetime PTSD (First, Spitzer, Gibbon, & Williams, 1998). The interview also included the modules for depression, social phobia, specific phobia, alcohol, and substance abuse. The interviewers were 10 candidate level students from the master's program in psychology (at least 3 years of full-time studies). Before the interviews, the interviewers received 8 h of formal training by the present authors. The principal author, who was blind to the results of the interviews, audited a random selection of the interviews ($n = 20$). A Cohen's kappa of 1.0 indicated excellent inter-rater reliability. The participants' treatment history was also systematically assessed during the interview: the interviewers asked about the type, duration, and frequency of any treatment that the participants received and whether the treatment was related to the disaster.

The data collected from surveys included suicidal ideation, history of stressful life events before the tsunami, and an assessment of personality. Suicidal ideation was retrieved from the surveys at T1–T3 as assessed by a single item that asked the participants whether they had had thoughts about suicide in the past 12 months (yes/no/unable to recall). The participants' history of stressful life events before the disaster was assessed in the survey at T1 by a Swedish life event checklist (Bergsten Brucefors, Sidén Silfver, & Schulman, 2001) with 15 dichotomous items (yes/no responses) covering a range of stressful life events (e.g., accident, disaster, war/terror, violence/abuse, serious illness/injury, serious conflict with significant others, death of significant others, unemployment, and severe economic hardships). All 15 events are among the top 20 most distressing events on the Revised Social Adjustment Rating Scale (Hobson et al., 1998). Stressful events post-disaster were examined during the interview by using the above life event checklist appended with an "other event" option.

The Big Five Inventory (BFI; John, Donahue, & Kentle, 1991) was administered in the survey at T3. The BFI is a brief personality inventory comprised of 44 items that are rated on a five-point Likert scale. The items form five subscales of the big five personality dimensions: agreeableness, conscientiousness, extraversion, neuroticism, and openness (John, Robins, & Pervin, 2008). The BFI has good psychometric properties, with Cronbach's alpha for the subscales ranging from 0.76 to 0.82 in the present sample and a 3-month test-retest reliability from 0.80 to 0.90 (John et al., 2008).

2.3. Statistical analysis

A power analysis indicated that with a total population of 6–8000 Swedish tourists in Southeast Asia (as estimated by tourist agencies) and an estimated incidence of 20% for PTSD, a sample of 200 individuals would provide a 95% confidence interval (CI)