

Mental Health Status of Vulnerable Tsunami-Affected Communities: A Survey in Aceh Province, Indonesia

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The authors determined the prevalence of severe emotional distress and depressive symptoms using the Hopkins Symptoms Checklist-25 (HSCL; Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974) in tsunami-affected communities that had experienced armed conflict arising from the ongoing independence movement in Aceh Province, Indonesia. We also evaluated determinants of severe emotional distress. The data were collected for the purposes of a mental health assessment. In our sample (N = 262), 83.6% demonstrated severe emotional distress, and 77.1% demonstrated depressive symptoms. In multivariate regression models, severe emotional distress was positively associated with the number of tsunami-related deaths among household members. Our data suggests a need for effective interventions in this vulnerable population.

The earthquake and subsequent tidal wave in December 2004 was one of the most significant natural disasters in recent history. The emotional and social sequelae of the event, for those who survived, are in a sense completely unknown. In Aceh province in Indonesia, over a 100,000 people were killed immediately, with many more left homeless. However, at first glance, one may be convinced that people are “picking up their lives again.” This belief is held despite the fact that the inhabitants of Aceh have lived through years of psychological and social stresses

due to conflict arising from a guerilla movement to free Aceh from Indonesia; very few lives in Aceh have been untouched by this conflict. To make matters worse, for months thousands of individuals resided in camps or barracks (set up by nongovernmental organizations and the Indonesian government) for those whose homes had been destroyed.

The psychological impact of mass catastrophes in developing countries is rarely evaluated systematically (Bland et al., 2005; McKelvey, Montazeri et al., 2005; Pernice &

Renato Souza and Kaz de Jong designed and planned the survey. Rosalie Reyes assisted with planning and logistics. Renato Souza and Rosalie Reyes oversaw the completion of the survey. Sasha Bernatsky performed the data analyses and wrote the initial draft of the manuscript. All co-authors participated in the review and finalization of the manuscript. We are grateful for the efforts of the Indonesian psychologists who assisted in the survey. We also thank the individuals who read the manuscript prior to its submission and offered input.

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© 2007 International Society for Traumatic Stress Studies. Published online in Wiley InterScience (www.interscience.wiley.com) DOI: 10.1002/jts.20207

Brook, 1996; Smith Fawzi et al., 1997; Thapa & Hauff, 2005; McKelvey, Webb & Mao, 1993). At the present time, relatively little detailed quantitative work on the issue in tsunami survivors has been published, although some authors have recently published assessments dealing with mortality and general morbidity related to the tsunami (Brennan, 2005; Centers for Disease Control and Prevention (CDC), 2006; Lim, Yoon, Jung, Joo Kim, & Lee, 2005; Nishikiori et al., 2006a, 2006b). Our primary objectives therefore were to measure the prevalence of depressive symptoms and severe emotional distress among vulnerable individuals in tsunami-affected communities, focusing on those that had been known to have experienced significant conflict related to the ongoing Aceh independence movement. As a secondary aim, we evaluated predictors of distress in this population.

METHOD

These survey activities were funded completely by MSF-Holland (Amsterdam, The Netherlands), an independent humanitarian medical aid agency providing assistance to populations regardless of race, religion, politics, or sex. Approval to use the previously collected data for the purposes of a peer-reviewed journal article was provided by the McGill University Institutional Review Board.

Participants

We completed a survey of psychologically vulnerable tsunami-affected individuals on the North Coast of Aceh Province in July 2005. The data were collected for the purposes of a mental health assessment in this region. The definition of psychological vulnerability included the following criteria: participants had to be living in displaced-persons camps or barracks, originally from coastal villages where the impact of the tsunami had been greatest, and highly likely to have significant preexisting psychosocial stress from conflict (based on the location of their original villages within conflict-affected zones). Our calculations indicated that a participant pool of about 260 individuals would afford enough power to enable us to calculate

the prevalence of severe distress with a 95% confidence interval of less than 12 percentage points, if the prevalence of distress was 60% or higher (Newcombe, Wilson, 1927; 1998).

The study population was comprised of the 10 barracks and 3 camps¹ serviced by Médecins Sans Frontières (MSF) in Aceh Utara, Lhokseumawe, and Bireuen. At each of these 13 locations, 20 persons were interviewed, representing approximately a 10–15% sample of the population of interest. At each site, a member of our team met with the chief (head² of the village where the people had originated from) explained our purpose, and asked where the center of the settlement (camp or barrack) was. Following techniques developed for surveys within the setting of a large displaced population (Brown, Moren, & Paquet, 1999), we randomly chose the first dwelling and subsequently interviewed the members of each second dwelling until the total number of interviews for that location was obtained. This resulted in a convenience sample of 262, allowing calculation of our estimates with acceptable precision. Within the dwelling, trained interviewers went to the first room of the dwelling and inquired about those living there. Because our study could (for security reasons) only be conducted during daylight hours (and this was when men were likely to be away from home), our sample was populated by more women than by men. Within a dwelling, we also asked if an old person lived in the dwelling, and gave preference to that individual person. Participants not eligible for inclusion were those less than 16 years of age.

Measures

The Hopkins Symptoms Checklist (HSCL; Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974) is an established and widely used screening instrument to measure severe emotional distress and depression; we used the 25-item version. The HSCL-25 is a symptom inventory, where

¹ Estimates of the size of the internally displaced persons (IDP) population on the west coast in the Aceh Utara, Lhokseumawe, and Bireuen districts are variable, but recent figures have been placed at over 79,000 (World Food Programme, 2005).

² The village chiefs in Aceh generally have maintained their status as community leaders even within the barracks or camps.

the first 10 items relate to anxiety, and the remaining 15 items measure depressive symptoms. Each question asks about the frequency of specific symptoms, with a scale of response categories (corresponding to *not at all*, *a little*, *quite a bit*, and *extremely*). Two scores were calculated: The total distress score is the average of all 25 items; the depressive symptoms score is the average of the 15 depression items. Thus, the entire HSCL-25 or its separate subportions can be used; the 15 items for depression are often used alone for evaluations of the existence of depressive illness. Consistently, across diverse populations, the total score is highly correlated with severe emotional distress, and the depression score with major depression as defined by the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)*; American Psychiatric Association, 1994; Kaaya et al., 2002; Smith Fawzi et al., 1997).

The instrument was specifically developed for adaptation and use in local settings throughout the world (McKelvey et al., 1993; Pernice et al., 1996; Smith Fawzi et al., 1997; Thapa et al., 2005); thus, it is already available in many languages, several of which are Indochinese. However, it had not yet been translated into the local languages spoken in Aceh (Bahasa Indonesia, and Acehnese). We therefore translated the questionnaire, following the recommended procedure, which includes cross-cultural translation of terms. This involved translation from English into the local language, blind back-translation back to the original English, and comparison and consensus of the terms in the translation and back translation. As prescribed by the developers of this tool, the HSCL-25 was administered by health care workers (trained psychologists who spoke the local languages) under the supervision and support of a psychiatrist. We also removed two questions from the original instrument, as they were potentially offensive in light of local customs and conduct.³

Data Analysis

In our sample, we calculated the prevalence of severe emotional distress (based on the total score) and depressive

symptoms (based on the depression items). For Indochinese populations, 1.75 has been identified as suitable cut-off average score for the presence of psychiatric illnesses (for both the total distress average score and the depression item average score; McKelvey et al., 1993; Smith Fawzi et al., 1997; Thapa et al., 2005). However, more conservative cut-off points (2.0 and 2.5) were alternatively used to define the prevalence of severe emotional distress (based on the total score) and depressive symptoms.

We also evaluated potential determinants of severe emotional distress, using the definition of a total distress average score greater than 1.75, given that this is the cut-off accepted in the literature (McKelvey et al., 1993; Smith Fawzi et al., 1997; Thapa et al., 2005). For this analysis, we ran a logistic regression model using the SAS version 9.1 statistical software system, including age (treated as a continuous variable), sex (man = 1, woman = 0), and number of first-degree relatives lost in the tsunami (treated as a continuous variable). The predictors were then all entered simultaneously and the results presented for this model. These variables were chosen because of data suggesting their association with adverse psychological sequelae in similar populations (Bland et al., 2005; Montazeri et al., 2005). The multivariate models thus determined the relative effects of our covariates (age, sex, and number of relatives lost), while concurrently adjusting for each variable. In a secondary analysis, we modeled a linear regression using the continuous total HSCL score.

RESULTS

No individuals refused participation in our survey. Three quarters of the 262 participants were women ($n = 199$, 75.9%). Detailed demographics are presented in Table 1. In the sample, the mean age was 40.3 years ($SD = 14.1$, median age 38 years). Those aged over 55 years numbered 43 (16.4%). Years of education were similar for men ($M = 4.9$, $SD = 3.7$) and women ($M = 5.1$, $SD = 3.8$). The majority (96.5%) of individuals identified themselves as currently working; the occupations most commonly listed by these individuals were housewife ($n = 150$, 73.2%), retail ($n = 21$, 10.2%), fishing ($n = 20$, 9.8%),

³ The questions removed concerned reduction in sexual desire and suicidal ideation.

Table 1. Demographics of Sample ($N = 262$)

	Women		Men		All	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Married	161	80.9	46	73.0	207	79.0
Widowed	25	12.6	8	12.7	33	12.6
Never Married	13	6.5	9	14.3	22	8.4
Currently working	192	96.5	38	60.3	230	87.8
Age >55	29	14.6	14	22.2	43	16.4
Dependent on donations for income	82	41.2	23	36.5	105	40.1

Note. The sample consisted of 199 women and 63 men.

Table 2. Prevalence of Severe Distress and Depression Symptoms in the Vulnerable Tsunami-Affected Sample Based on Hopkins Symptoms Checklist-25 (HSCL-25) scores^a

	Women		Men		All	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Total distress score average						
>1.75	167	83.9	52	82.6	219	83.6
>2.00	140	70.3	43	68.3	183	69.8
>2.50	90	45.2	25	39.7	115	43.9
Depression score average						
>1.75	152	76.4	50	79.4	202	77.1
>2.00	119	59.8	39	61.9	158	60.3
>2.50	82	41.2	23	36.5	105	40.1

^aThe definition of psychological vulnerability included the following criteria: Participants had to be living in displaced-persons camps or barracks, originally from coastal villages where the impact of the tsunami had been greatest, and highly likely to have had significant preexisting psychosocial stress from conflict (based on the location of their original villages within conflict-affected zones).

^bThe sample included 199 women and 63 men.

and farming ($n = 14$, 10.2%). Many ($n = 105$, or 40.1% of the entire sample) were still dependent on donations for their livelihood. Dependency on donations was most common for women and older individuals (data not shown). Over a third (34.4%) of the participants had lost at least one first-degree relative in the tsunami, with the range for number of deaths being 0 to 9.

Using the cut-off of 1.75 for the average total score, 83.6% of our sample (95% confidence interval [CI] = 78.6–87.6) were identified as being severely emotional distressed, and 77.1% (95% CI = 71.8–81.8) were identified as being depressed. With a more conservative cut-off of 2.00, the percentage with important emotional

distress was 69.8% (43.9% if the definition was >2.50), and the percentage with depression was 60.3% (40.1% if the definition was >2.50).

In our logistic regression models, the prevalence of severe emotional distress was positively associated with number of tsunami-related deaths among household, odds ratio (OR) = 1.68 (95% CI = 1.02–2.80). Younger individuals were more likely to have severe distress than older individuals; the OR for increasing age was 0.97 (95% CI = 0.95–0.99). The secondary analyses using the total distress scores in linear regressions showed similar findings, with the number of deaths being a significant predictor of total distress, rate ratio = 1.09 (95% CI = 1.01–1.16).

DISCUSSION

Our results reveal the massive burden of severe psychological distress and depressive symptoms in vulnerable individuals from tsunami-affected communities in Aceh. Our sample was drawn from particularly vulnerable tsunami-affected communities that had been known to experience armed conflict. It should be noted of course, that in Aceh very few lives have been untouched by the conflict arising from the independence movement. Thus, the majority of the population that were affected by the tsunami, in fact, could be considered as being vulnerable to psychological harm due to these preexisting stressors. We acknowledge that the levels of emotional distress and depression that we documented may have been related to this preexisting climate.

The high prevalence of severe emotional distress and depression in this population corroborates with our qualitative assessments in the same localities. Both the government of Indonesia and the international community have done enormous work in community and social reconstruction, but these efforts have not sufficiently addressed the problem of mental health. A strategic plan to address immediate and long-term mental health needs should be a priority for all stakeholders (governmental and nongovernmental) involved in relief work within this and other tsunami-affected areas. The current mental health services structure in Aceh province is not capable of addressing existing needs. International and local mental health experts should work hand-in-hand to design and implement appropriate strategies.

Some authors state that after major disasters, most mental health problems will resolve through a natural period of recovery over about 6 months (Gray, Maguen, & Litz, 2004). Our survey shows that in this vulnerable population, the mental health needs are still immense well beyond this time. Our findings (e.g., association of distress with number of tsunami-related deaths in household members) identify those at higher risk of mental health problems in disaster situations, where concentrated efforts for support could be made in the emergency phase. Interestingly, younger, not older, individuals were most at risk for psychological distress; the age group <20 years seemed to

have particularly high prevalence of great distress. Though the aged have been described as being particularly vulnerable to the stresses of a natural disaster, other studies confirm our findings that adolescents and young adults form another at-risk population (Rousseau, Drapeau, & Platt, 2004).

Regarding these first-degree family member losses, we did not collect detailed information about the role of each relative lost, either in terms of relationship (e.g., spouse vs. child, son vs. daughter), or perceived value of that relationship, so we cannot comment directly in this regard. However, closer inspection of the data can provide some possible insights. For example, those who were widows or widowers ($n = 33$) seemed less likely to experience the relationship between loss of loved ones and severe distress (adjusting for age and sex) that had been seen in the overall sample. Married individuals (again adjusting for age and sex) seemed to experience more severe distress than nonmarried individuals (i.e., those who were single and widowed). It is possible that the relatively high emotional impact seen in the married group reflects the loss of young children.

As is well known, the very young and the very old were the least able to escape from the giant wave, and thus many of the family deaths reported by our sample were no doubt due to the tragic death of a child. Grieving in this type of scenario is intense, and often guilt and self-blame are experienced by the surviving parent. It can be noted, however, that among those identified as single or never married ($n = 22$) all were experiencing severe distress as identified by a HSCL score of >1.75 . Thus, although a loss of a spouse can be very difficult, the high prevalence of distress among those who were still married or among those who had never married, suggests that the loss of other family members can be as or possibly more important.

In a postdisaster setting, the high risk of psychological problems should motivate the development of public mental health approaches that could address these needs on a large scale. Both action and research is needed; there should be no further delay in implementing treatments already proven (e.g., fluoxetine for posttraumatic stress disorder [PTSD] and depression; Schoenfeld, Marmar, & Neylan,

2004; Williams et al., 2000. Other strategies may need to be adapted and tested, but this should be done without further delay. Behavioral treatment for anxiety disorders, including PTSD, have been proven (Gray & Litz, 2005); these evidence-based interventions can be adapted to the local cultural context. Medium and long-term mental health services and social interventions are useful. However, there are very high needs that should be addressed immediately. Evidence-based strategies to reduce the mental health impact of major natural disasters need to be established.

The strength of our work is that this was the first major systematic survey of the mental health of tsunami-affected populations, and that we used a well-recognized tool that has been widely used in traumatized populations in developing Indochinese countries. Regardless, possible limitations should be considered. One relates to the interpretation of the HSCL-25. In theory, each newly adapted screening instrument should have its cut-off point determined by comparing the scores on the instruments to a clinical diagnosis. On the other hand, the HSCL-25 was specifically developed for adaptation and use in local settings, and we followed the steps recommended by the authorities in adapting it for use in our setting. Most other instruments are too long, have not been validated cross culturally, need highly specialized staff, and are mainly qualitative. In other Indochinese populations, an HSCL-25 average of 1.75 has been scientifically identified as a suitable indicator for the presence of psychiatric illnesses (McKelvey et al., 1993; Smith Fawzi et al., 1997; Thapa et al., 2005). We note that in our conservative Muslim context, two items had to be omitted from the HSCL-25 to make it culturally appropriate; though a minor point, this slight adaptation should not be forgotten in terms of comparisons with other Indochinese populations.

We acknowledge the limitations of our work regarding sampling and the question of generalizability. Women made up a larger proportion of the survey sample, and the elderly were purposely oversampled. However, the results, stratified by sex, show that the men in the sample experienced a similarly high frequency of distress (see Table 2). Regarding age, even with oversampling, the elderly were

not frequently found in our sample. In terms of demographics, an older (>55) person was resident in about 16% of the dwellings. In addition, we might point out that our results are virtually unchanged if we exclude elderly individuals. Furthermore, we are describing phenomena that are important regardless of the demographic distribution of our population. For these reasons, we believe that our work, regardless of sampling limitations, represents an extremely important contribution and provides conclusions that are not necessarily completely restricted by the demographics of the sample. Still, the generalizability of the results can no way be guaranteed.

Several nongovernmental organizations have provided outreach in barracks and villages. Psychoeducational resources have been employed to help people understand the nature of their symptoms, and therapeutic techniques offered to reduce anxiety and depressive symptoms. People with more severe forms of mental distress have been treated at trauma centers where more in-depth assessment occurs. It is hoped that such efforts, in concert with the work of the local government, are effective in easing the heavy psychological burden borne by survivors.

In summary, our results indicate a striking prevalence of severe emotional distress and depression in vulnerable tsunami-affected populations of Aceh; our sample focused on communities that had experienced significant armed conflict arising from the independence movement in Aceh, but it should be noted that the lives of most Acehnese have been affected by this conflict. More effort should be focused on delivering effective interventions to address the psychological needs of this population.

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