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Predictors of trauma and distress in Sri Lanka five years after the Indian Ocean tsunami: A cross-sectional study

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ABSTRACT

No study has yet explored the predictors of posttraumatic symptoms in adults beyond the first couple of years after the tsunami. This cross-sectional study aims to explore the demographic, psychological and social predictors of mental health outcome (Impact of Event Scale-Revised, General Health Questionnaire-12) in a sample of 404 adults with high tsunami-exposure almost five years after the Indian Ocean tsunami in Sri Lanka. The results of the regression analysis showed surprisingly, that in the multivariate analysis posttraumatic symptoms were not predicted by variables such as 'loss of family or friends' and 'thinking one's life was in danger during the tsunami'. Instead posttraumatic symptoms were most strongly predicted by the variable 'loss of income' as well as number of other trauma-impact variables which could be suspected to act as chronic stressors. The regression analysis on GHQ-12 showed that distress was predicted by age, education, language, posttraumatic symptoms and social support. Long-term interventions for postdisaster distress should consider not only the past traumatic exposure, but also how trauma impact variables may act as chronic stressors in the present situation. Finally socio-contextual variables such as income, education and social support should be considered as equally valuable targets for intervention.

1. Introduction

On December 26th 2004, the Indian Ocean tsunami struck regions of South Asia and East Africa. The tsunami killed approximately 230,000 people and affected millions of lives in more than a dozen countries. Sri Lanka was hard hit, reporting 31,187 deaths, 4280 missing, 23,189 injured, and 545,715 displaced [20]. Readers are referred to Ghodse and Galea [14] for an account of the global impact of the tsunami.

Although the majority of people exposed to disasters are resilient or recover from early post-trauma symptoms, previous disaster research also suggests that serious mental health problems prevail among a portion of those exposed [32,40]. Wickrama and Kasper [40] found that 41% of adolescents and 20% of their mothers had PTSD four months after the tsunami and Hollifield et al. [20] found that prevalences for clinically significant PTSD, depression and anxiety were respectively 21%, 16% and 30% 21 months after the tsunami.

Post-disaster PTSD has been associated with sociodemographic and background factors, event exposure characteristics, social support factors and personality traits [30]. In the context of the Indian Ocean tsunami a number of predictors for mental health outcome have been explored in the first couple of years after the disaster. Three to four weeks after the tsunami PTSD symptoms were predicted by the severity of trauma exposure, family loss as well as previous traumatic events [31]. Almost two years after the tsunami in Sri Lanka three exposure items were significantly correlated with symptoms and/or impairment: (1) thinking one's life was in danger, (2) injury to family members and (3) death of a family member [20].

Very few studies have examined the effects of natural disasters beyond the first two or three years [13,33]. A number of long-term studies focusing on tsunami-affected populations [29,41] but only one study has examined the effects of the tsunami on traumatic stress beyond the first couple of years [1]. The study found that 4.5 years after the tsunami 63% of the adolescents presented moderate to severe PTSD symptoms, and the factors that increased symptom severity were female gender, loss of parents, low support level and heavy somatic response.

1.1. Purpose

To the knowledge of the authors no study has yet investigated predictors of traumatization among adult tsunami-survivors

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beyond the first two years after the disaster. This cross-sectional study aims to investigate the contribution of demographic, psychological and social predictors to mental health outcome in adults four years and eight months after the tsunami in Sri Lanka, specifically to the level of traumatization (Impact of Event Scale-Revised) and general distress (General Health Questionnaire).

2. Methods

2.1. Survey and sampling

The present report is based on a survey conducted for the American Red Cross (ARC) and the Sri Lanka Red Cross Society as a part of the evaluation of their Tsunami Recovery Program's Psychosocial Support Program (TRP PSP) which was implemented in tsunami-struck communities in Sri Lanka six months after the tsunami. The data was collected by Social Indicator (SI), the Colombo-based survey research unit of the Centre for Policy Alternative. The surveying took place in August 2009 and was conducted by senior field staff, who had all participated in a five day training session regarding field techniques, objectives of the survey etc.

Sri Lanka is divided into a total of 25 districts. The sample for the current study was drawn from the five districts of Sri Lanka that the TRP PSP had been implemented in – Gampaha, Colombo, Kalutara, Galle, and Matara. The districts are further divided into GN divisions (villages), which were the primary sampling units for this survey. Originally a total sample of 1128 respondents from 30 randomly chosen GN divisions was to be included in the survey. In each division 35 interviews were conducted using a skip pattern based on the number of households located in that area. Each sample spot had 1–4 starting points based on the size of the division. Interviewers followed the right hand rule and started at the 5th house on the right from the starting point. Respondents were chosen by ranking from youngest to oldest all eligible permanent residents of a household and then using a Kish grid to choose the respondent. A new respondent was chosen only if the interviewer was unable to interview the respondent even after three callbacks or if they refused to be part of the survey. Though the Kish grid and call back methods were strictly adhered to it could not prevent an oversampling of women due to their higher availability during the time of day the survey was conducted. A high proportion of the men either worked out of town and only returned home once a week/month or they returned home from work only very late in the night.

Of the original 1128 interviews 38 were incomplete and 72 were no response, which left 1018 interviews for analysis. The response rate was thus 90.2%.

The structured questionnaire used for surveying was provided by ARC and translated by Social Indicator into the two local languages – Sinhala and Tamil. At the questionnaire translation stage Social Indicator along with ARC and SLRCS checked the compatibility of the questionnaire with the English version and between the Sinhala and Tamil versions to ensure uniformity in meaning. To the knowledge of the authors these questionnaires had not previously been used in the languages of the study. However, as described below, they have both been applied across a wide range of settings and cultures and we found both scales to be highly reliable (see Cronbach's alphas below).

The survey was designed in such a way that only respondents who answered 'yes' to at least one trauma-exposure variable (e.g. 'badly injured by tsunami', 'relatives/friends dead') would answer the Impact of Event Scale Revised (IES-R). 404 (out of 1018) respondents (that is 39.7%) answered yes to at least one of these exposures and thus answered both the IES-R and General Health Questionnaire (GHQ) scales. Because the current study aims at investigating the predictors of traumatization these 404 respondents with a relatively high trauma exposure were chosen as the sample for all our analyses. The data were complete except for one person missing one item on GHQ and two persons missing one item regarding education.

2.1.1. Survey instrument

The structured questionnaire consisted of several parts: (a) Respondent information, items concerning demographics, resources, and trauma exposure characteristics; (b) General Health Questionnaire (GHQ-12); and (c) Impact of Event Scale-Revised (IES-R). Level of agreement to the survey question: "*When I have a problem I feel confident that members of my community will help me*" was used as a proxy for perceived social support.

2.1.2. Impact of Event Scale-Revised

The Impact of Event Scale [21] was originally a 15-item self-report measure of the frequency with which intrusions and avoidance are experienced in the aftermath of a distressing event. In an effort to make the IES scale more reflective of the tripartite (intrusion, avoidance, and hyperarousal) symptom criteria which was later outlined in the DSM IV, the scale IES-R was developed [39]. The IES-R contains eight intrusion and eight avoidance items, derived from the original IES, and adds to this six items assessing hyperarousal. Hyperarousal symptoms were not included in the original IES-scale of 1979. In the new IES-R version subjects are asked to indicate on a scale from 0 to 4 how disturbing symptoms were during the previous seven days.

Weiss and Marmar [39] reported satisfactory psychometric data and the scale showed high internal consistency with coefficients ranging from 0.79 to 0.92 and test–retest correlations ranging from 0.51 to 0.92 for the three subscales. IES-R has been adopted as a measure of traumatic stress in numerous studies and has been translated into several other languages.

The creators [39] recommend using means instead of raw sums for each of the subscales scores to allow comparison with scores from the Symptom Checklist 90-Revised (SCL-90-R). A number of studies using or assessing the IES-R though [12,4,6] have reported using raw sum-scores to arrive at the total IES-R scale score between 0 and 88. The scale is not designed to be diagnostic of PTSD and there is no specific cut-off score. Cronbach's alpha was calculated for the Sinhalese speaking part of our sample and the 22 item scale was found to be highly reliable ($\alpha = 0.95$).

2.1.3. The General Health Questionnaire

The GHQ [18] has been extensively used in a wide range of settings and cultures since its development by Goldberg in the 1970s. It is a measure of minor psychiatric morbidity that is recent, general and non-psychotic [15] and also predicts more severe mental disorder [26]. The GHQ-12 is based on the respondents' assessment of their present state relative to their usual, or normal, state [17] and includes items such as 'Been able to concentrate on whatever you are doing' and 'Lost much sleep over worry'.

The GHQ-12 has been validated in a variety of settings [22,34] and the validity is believed unlikely to be affected by the language of the questionnaire [15]. Each item is rated on a four-point scale (e.g. "less than usual", "no more than usual") and total scores of 12 or 36 are obtained, depending on the scoring procedure selected. In this study we used the bimodal scoring giving a total score between 0 and 12 with higher scores indicating more distress [34]. The mean GHQ-12 score for a population has been suggested as a rough indicator for the best cut-off point [16]. Based on the mean of our sample, the cut-off point 6/7 was used to reflect an increased risk for psychological distress and/or psychiatric conditions. Cronbach's alpha was calculated for the Sinhalese speaking

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