Psychosocial support during displacement due to a natural disaster: relationships with distress in a lower-middle income country

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Background: Past studies show relationships between disaster-related displacement and adverse psychosocial health outcomes. The development of psychosocial interventions following displacement is thus increasingly prioritized. However, data from low- and middle-income countries (LMICs) are lacking. In October 2017, the population of Ambae Island in Vanuatu, a lower-middle income country, was temporarily displaced due to volcanic activity. We analyzed distress among adults displaced due to the event and differences based on the psychosocial support they received.

Methods: Data on experiences during displacement, distress and psychosocial support were collected from 443 adults 2–3 wk after repatriation to Ambae Island. Four support categories were identified: Healthcare professional, Traditional/community, Not available and Not wanted. We analyzed differences in distress by sex and group using one-way ANOVA and generalized linear models.

Results: Mean distress scores were higher among women (1.90, SD=0.97) than men (1.64, SD=0.98) (p<0.004). In multivariate models, psychosocial support group was associated with distress among women (p=0.033), with higher scores among women who reported no available support compared with every other group. Both healthcare professional and traditional support networks were widely used.

Conclusions: Women might be particularly vulnerable to distress during disaster-related displacement in LMICs, and those who report a lack of support might be at greater risk. Both healthcare professional and traditional networks provide important sources of support that are widely used and might help to ameliorate symptoms.

Keywords: developing country, intervention, mental health, Pacific, psychological distress, psychosocial health

Introduction

Population displacement is common and increasing: 65 million people are currently forcibly displaced from their homes, with an estimated 86% of displaced people in low- and middle-income countries (LMICs).[1] With climate change, natural disaster-related displacement is likely to become increasingly common.[2–5] Displacement due to natural disasters poses unique challenges compared to other forms of displacement,[4] especially in small island developing states.[6] Natural disasters result in additional stress to infrastructure, which can exacerbate burdens for displaced populations, particularly in LMICs, which may lack the resources for adequate preparedness and recovery plans.[7,8]

Natural disasters pose significant consequences for mental health: both displacement and natural disaster exposure are associated with increased psychosocial stress, anxiety, depression and distress.[9–13] Symptoms are often particularly severe for women.[9,14] However, data on psychosocial health outcomes following disaster-related displacement in LMICs are limited.[5] Findings from high-income countries are likely not generalizable

to LMICs, where mental health service provision is already inadequate[15] and is often further weakened due to disaster.[16] The relative lack of research in LMICs complicates the direction of humanitarian and international aid to individuals in need and the development of locally sustainable mental health services, and is detrimental to the development of adequate disaster preparedness policy. More research on the effects of displacement on psychosocial health outcomes,[17,18] especially in LMICs,[7] is therefore necessary.

In October 2017, the entire population of rural Ambae Island in Vanuatu, a lower-middle income country of 280 000 people in the South Pacific, was evacuated due to high levels of volcanic activity that prompted fears of imminent eruption. Following a moderate eruption, around half of the population was moved to shelters elsewhere on the island, but within a few days officials raised alerts of flying rocks, acid rain and ash falls, and ordered a full-scale evacuation. A total of 10 869 people representing 2912 households were moved to nearby rural islands (Santo=8385; Pentecost=1475; Maewo=609) or to Efate Island (n=400), home of the urban capital Port Vila, for a period of 4–6 wk.[19] Displaced families experienced continued uncertainty about whether the volcano would erupt, damage to personal property, and loss and death of livestock during the displacement. Furthermore, destruction of crops and contamination of water supplies due to heavy ash fallout resulted in fear about long-term health effects of the disaster. Based on our past work on maternal psychosocial health following natural disasters in Vanuatu,[20,21] we created a study to assess psychosocial distress among the displaced population shortly after the return of families to their homes.

This is a unique model because in recent years the Vanuatu Ministry of Health has focused on increasing mental health capacity in the country. The government launched a mental health policy initiative in 2009 which aimed to train healthcare workers in mental health and to create a pool of trainers to support new healthcare workers. From 2009 to 2011, 63 healthcare workers were trained in mental health.[22] While this outcome is a major advancement, it also reflects the reality of limited mental health infrastructure in Vanuatu. Data from 2011 and 2012 show an estimated 443 doctors, nurses and midwives in the public sector and an average of 1.77 health workers per 1000 members of the population, which is below the recommended WHO average of 2.3.[23] Funds were insufficient to create more positions, and resources were even more scarce in mental health in particular. Additionally, the distribution of the population across rural islands makes service provision difficult, and in many communities Western medical models for psychosocial health treatment are less well accepted and traditional medicine is preferred.[22,24] Mental health gained increased public attention following Cyclone Pam in 2015, as international professionals joined the doctors and nurses already working in mental health to train other local practitioners in mental health assessment and support.[25,26] Since then, an increasing number of local health professionals have participated in mental health training workshops, and are equipped to offer psychosocial assessments and care. This trend toward increasing mental health capacity in Vanuatu contributed to a first-of-its-kind response to the Ambae Island evacuation, when a small team was sent to provide psychosocial support in the form of professionally led group discussions and individual psychological first aid in some displacement camps.

Our objectives in this study were to characterize levels of distress among the displaced population, to characterize the psychosocial support received by displaced individuals, and to analyze differences in distress among men and women and among psychosocial support groups. We hypothesized that distress levels would be higher among women than men, and that distress levels would vary based on the type of psychosocial support received.

Materials and methods

This study was reviewed and approved by the Comité institutionnel d'éthique de la recherche avec des être humaines (Institutional Committee on Ethics for Research Involving Humans) at the Université du Quebéc à Montréal, and by the Vanuatu Minstry of Health. All participants provided informed consent.

Sample

Data were collected in 13 villages representing four main regions (north, south, east and west) on Ambae Island. Eligible participants included all adults who had been displaced from the island. Data were collected in November–December 2017, 2–3 wk following the return of families to their homes. Local research assistants visited villages the day before data collection to inform community members through informational flyers and meetings with village chiefs, who shared information throughout the community. Questionnaires were distributed in central locations such as local community centers, clinics, churches and other community buildings. The goal of the convenience sample was to reach as wide a demographic as possible to allow for broad characterization of distress at the population level.

Questionnaire

We created a self-report questionnaire to assess demographics (age, marital status, years of education, occupation, number of children and household size), experiences of displacement (housing type, resources available and services received), nutritional patterns during and following displacement, and distress. Questionnaires were written in Bislama, the lingua franca of Vanuatu.

Experiences of displacement

Participants reported the village and island where they stayed during displacement, length of displacement, which family members stayed together, housing type (with friends or family, in a community building such as a school or a church, in a tent or temporary shelter, or other), and whether they had sufficient housing, food and water during the displacement period.

Distress

Distress was assessed using a questionnaire developed from items in the Impact of Event Scale—Revised (IES-R).[27,28] The IES-R is a 22-item questionnaire which is among the most commonly used to assess post-traumatic stress reactions.[29] Items address categories of intrusive thoughts (eight questions),

avoidance (eight questions) and hyperarousal (six questions). For the development of our distress questionnaire, all 22 items on the IES-R were translated to Bislama and reviewed by local speakers. Five items found redundant after translation were removed. To avoid questionnaire fatigue, we selected three items from each category (intrusive thoughts, hyperarousal and avoidance) in the final questionnaire. Participants were instructed to report how distressing each item was during the past 7 d with respect to the period of displacement due to the volcano on a scale of 0 ('Not at all') to 4 ('Extremely'). The mean of response values for all nine items were used for analyses. Scores in the current sample ranged from 0–4. Table S1 lists the English translation of the nine questionnaire items in the distress questionnaire.

Studies of distress assessed via questionnaire often use cut-offs to categorize participants into low- and high-distress groups for comparison with other studies. A cut-off of $\geq$37 on the IES-R has been used in other studies to classify high distress, because long-term suppression of immune function has been identified among men with previous post-traumatic stress disorder (PTSD) who had a mean score of 37 on the IES-R.[30] This translates to a mean score of 1.7 on our questionnaire, which we used to categorize participants with high distress levels to facilitate comparison with other studies.

Psychosocial support during displacement

We asked participants a series of questions on whether psychosocial support was received, either individually or in groups, from doctors, nurses or support groups; if no support was received, whether it was unavailable or unwanted; and an open-ended question asking participants to list other sources of support. Based on responses, we were able to categorize people into one of four groups. One group of participants reported receiving support from a healthcare professional, either individually or in a support group ('Healthcare professional'). These participants might also have received support from other sources. A second group reported receiving no support because it was not available ('Not available'). A third group reported receiving no support because it was not wanted ('Not wanted'). Finally, a fourth group received no support from a healthcare professional because it was unavailable and/or not wanted, but reported receiving support in the form of traditional or community support systems such as chiefs, pastors and traditional healers ('Traditional/community').

Analyses

We analyzed descriptive statistics, including differences in mean distress scores by sex and psychosocial support group, using one-way ANOVA. We categorized participants with high-distress symptoms and used chi-squared analyses to test differences by sex and by the island to which participants were evacuated.

We tested predictors of distress levels using generalized linear models (GLM), with distress as the dependent variable. In Model 1, we tested island of evacuation and sociodemographic (age, years of education, number of children and household size) control variables. We retained those with p-values <0.10 and added psychosocial support group in Model 2. Finally, in Model 3, we tested if the effects of psychosocial support group persisted when including all sociodemographic control variables. Analyses were conducted separately for men and women.

Statistical significance was defined as p<0.05. Analyses were conducted with SPSS Version 22.0 (IBM, Armonk, NY, USA).

Results

Sample characteristics

Questionnaires were completed by 479 participants (226 men and 253 women). Data on psychosocial health support were

Table 1. Sample size and means (SD) for sociodemographic variables and distress by sex and psychosocial support group

	Healthcare professional	Traditional/community	Not wanted	Not available	p-value	Total
Men						
n (%)	115 (55%)	38 (18%)	6 (3%)	50 (24%)		209
Age (y)	48.1 (16.4)	38.8 (16.2)	41.0 (15.4)	44.6 (17.6)	**0.025**	45.4 (16.9)
Education (y)	7.4 (3.6)	8.4 (3.3)	10.5 (2.8)	8.4 (3.3)	0.064	7.9 (3.5)
Number of children	3.9 (2.5)	2.7 (2.7)	2.8 (2.3)	3.6 (2.5)	0.094	3.6 (2.5)
Household size	5.1 (2.5)	5.1 (2.1)	4.8 (2.6)	4.1 (1.8)	0.087	4.8 (2.3)
Distress	1.6 (0.9)	1.8 (1.0)	1.4 (0.8)	1.7 (1.1)	0.741	1.7 (1.0)
Women						
n (%)	136 (58%)	43 (18%)	12 (5%)	43 (18%)		234
Age (y)	42.0 (14.9)	41.2 (15.2)	39.2 (12.5)	43.4 (15.3)	0.815	42.0 (14.8)
Education (y)	7.1 (2.8)	7.2 (3.0)	9.2 (2.7)	6.8 (2.9)	0.091	7.2 (2.9)
Number of children	3.9 (2.4)	3.9 (2.2)	3.1 (1.8)	4.2 (2.2)	0.531	3.9 (2.3)
Household size	4.6 (2.3)	5.2 (2.6)	4.3 (1.8)	5.1 (2.6)	0.338	4.8 (2.4)
Distress	1.9 (0.9)	1.8 (0.9)	1.5 (1.1)	2.2 (1.0)	**0.046**	1.9 (1.0)

P-values in bold are considered statistically significant (p < 0.05).

incomplete for 33 participants and distress data were incomplete for a further 3 participants, leaving 443 participants for analyses (92% of the sample). Table 1 shows descriptive statistics for men and women, including p-values for differences among groups based on psychosocial support received.

Experiences of displacement

Participants were displaced to four different islands, with 65% staying on Santo, 24% on Pentecost, 7% on Maewo and 4% on Efate, consistent with figures for the population as a whole (Santo=77%, Pentecost=14%, Maewo=6% and Efate=4%).[19] Sufficient housing was reported by 78% of people (74% on Santo, 82% on Efate, 84% on Pentecost and 97% on Maewo, p=0.015); sufficient food by 82% (77% on Santo, 88% on Efate, 90% on Pentecost and 100% on Maewo, p=0.001); and sufficient water by 83%, with no differences among islands (p=0.415).

Distress among displaced individuals

Mean distress scores differed significantly among islands (1.7 on Santo, SD=1.0; 2.0 on Efate, SD=1.1; 2.0 on Pentecost, SD=0.9; 1.6 on Maewo, SD=1.0; p=0.015). Mean distress scores were higher among women (1.90, SD=0.97) than men (1.64, SD=0.98) (p<0.004). Prevalence of high distress was 53% and was higher among women (56%) than men (45%) (p=0.014).

Psychosocial support during displacement

Of the participants in the study, 57% received support from healthcare professionals (either individually or in groups), 21% received no support because it was not available, 4% received no support because it was not wanted and 18% received no healthcare professional support but received traditional or community support. Percentages in each group did not differ by sex (p=0.357) or island of evacuation (p=0.090). Mean age differed significantly among groups for men (p=0.025) but there were no differences in other sociodemographic variables among groups for men or women. One-way ANOVA indicated that mean distress scores did not differ among groups for men (p=0.741) but differed significantly among women (p=0.046) (Table 1).

Further analyses within each group highlighted the importance of traditional or community support systems in addition to healthcare professional and group support: within the Healthcare professional group, 48% of people also reported receiving community support. They also highlighted reasons for lack of support. For example, of those who received traditional or community support, 83% reported that healthcare professional support was not available and 35% reported that they did not want healthcare professional support. Finally, 10% of people in the Not available group also reported not wanting support.

Results of generalized linear models testing distress among groups

Table 2 shows results of the three GLM, with p-values and effect sizes (partial η^2). Among men, island of evacuation (p=0.426), age (p=0.078), years of education (p=0.095), number of children (p=0.103) and household size (p=0.548) were not significant predictors of distress (Model 1). In Model 2, retaining age and years of education, psychosocial support group was not a predictor of distress (p=0.780). Results were unchanged when retaining all sociodemographic control variables (Model 3).

Among women, island of evacuation (p=0.180), years of education (p=0.501), number of children (p=0.136) and household size (p=0.718) were not significant predictors of distress, but age was negatively associated with distress (p=0.043) (Model 1). In Model 2, retaining age in the model, psychosocial support group was a significant predictor of distress (p=0.033). Adjusted means indicated that women who reported no available support had higher distress scores compared with every other group, averaging 0.37 (95% CI=0.04–0.69) points higher compared with those who received healthcare professional support, 0.77 (0.16–1.37) points higher than those who did not want support and 0.46 (0.06–0.86) points higher than those who received only traditional or community support. Results were unchanged when retaining all sociodemographic control variables (Model 3).

Figure 1 summarizes results of Model 2, showing adjusted means for distress for (a) men and (b) women.

Discussion

This study highlights relationships between short-term displacement due to a natural disaster and psychosocial distress among men and women, and differences based on psychosocial support received during evacuation. We observed higher distress among women than men, consistent with other studies. Among women, distress differed based on psychosocial support received. These findings could help to identify groups at risk and pathways for intervention in other communities displaced due to natural disasters in LMICs.

Study strengths include participation of men and women from multiple villages around the island. Differences in availability and use of formal and informal psychosocial support services allowed us to test relationships with distress. However, the self-reporting questionnaire is a limitation of the study. Our distress questionnaire uses only 9 of 22 items from the IES-R. It therefore provides a limited portrait of distress and cannot be directly compared with studies using the IES-R. In addition, the distress experienced likely results from the events of the displacement itself, as well as fear and uncertainty due to the volcanic activity. Results might not be generalizable to other displacement events. Furthermore, we do not have objectively measured data on the types of support received by each participant, or details such as the number of individual or group sessions attended. Finally, the convenience sample might not be representative of the entire population.

Distress following displacement and disasters varies widely based on the nature of the event, the services available, the sample assessed and the assessment measures used. Figures in our sample (53% with high distress overall) are consistent with patterns in other studies of natural disasters in LMICs. For example, prevalence of PTSD was about 30% among adults in displacement camps 2–4 mo after the 2010 Haiti earthquake,[31] 50% 1 y after an earthquake in Armenia[32,33] and 71% 4 y after a tsunami in India.[34] Similarly, 6 mo after severe flooding in

Table 2. Results of generalized linear models testing predictors of distress

	Model 1			Model 2			Model 3		
	β	p-value	η^2	β	p-value	η^2	β	p-value	η^2
Men									
Island of evacuation	—	0.426	0.01	—	—	—	—	—	—
Pentecost	0.10	0.772	<0.01	—	—	—	—	—	—
Santo	−0.15	0.666	<0.01	—	—	—	—	—	—
Maewo	−0.24	0.563	<0.01	—	—	—	—	—	—
Efate (ref.)	—	—	—	—	—	—	—	—	—
Age (y)	−0.01	0.078	0.02	−0.01	0.350	<0.01	−0.01	0.113	0.01
Education (y)	0.04	0.095	0.02	0.03	0.239	0.01	0.03	0.146	0.01
Number of children	0.06	0.103	0.01	—	—	—	0.06	0.097	0.01
Household size	0.02	0.548	<0.01	—	—	—	0.02	0.598	<0.01
Psychosocial support	—	—	—	—	0.780	0.01	—	0.755	0.01
Healthcare professional	—	—	—	−0.04	0.807	<0.01	-0.05	0.753	<0.01
Traditional/community	—	—	—	0.05	0.826	<0.01	0.05	0.803	<0.01
Not wanted	—	—	—	−0.39	0.360	<0.01	-0.38	0.359	<0.01
Not available (ref.)	—	—	—	—	—	—	—	—	—
Women									
Island of evacuation	—	0.180	0.02	—	—	—	—	—	—
Pentecost	−0.29	0.411	<0.01	—	—	—	—	—	—
Santo	−0.52	0.115	0.01	—	—	—	—	—	—
Maewo	−0.64	0.108	0.01	—	—	—	—	—	—
Efate (ref.)	—	—	—	—	—	—	—	—	—
Age (y)	−0.01	**0.043**	0.02		**0.050**	0.02	−0.01	**0.043**	0.02
Education (y)	0.02	0.501	<0.01	—	—	—	0.01	0.654	<0.01
Number of children	0.06	0.136	0.01	—	—	—	0.04	0.237	0.01
Household size	0.01	0.718	<0.01	—	—	—	-0.01	0.881	<0.01
Psychosocial support	—	—	—	—	**0.033**	0.04	—	**0.038**	0.04
Healthcare professional	—	—	—	−0.37	**0.027**	0.02	−0.36	**0.029**	0.02
Traditional/community	—	—	—	−0.46	**0.024**	0.02	−0.46	**0.026**	0.02
Not wanted	—	—	—	−0.77	**0.013**	0.03	−0.76	**0.015**	0.03
Not available (ref.)	—	—	—	—	—	—	—	—	—

P-values in bold are considered statistically significant (p < 0.05).
Model 1: Island of evacuation and sociodemographic covariates.
Model 2: Psychosocial support group, with covariates identified from Model 1 (p<0.10).
Model 3: Psychosocial support group with all sociodemographic covariates.

Mexico, disaster-related PTSD was 46% among adults in a heavily affected region, all of whom were relocated due to the disaster.[35] Symptoms are often more severe among women than men: for example, 2.5 y after the 2010 Haiti earthquake, prevalence of peritraumatic distress, PTSD and depression were all higher among women (78%, 48% and 30%, respectively) than men (57%, 26% and 22%, respectively).[36]

Studies testing the effects of disaster-related displacement specifically highlight that symptoms might be more severe among displaced populations, but displacement itself is not necessarily the most important predictor of distress. For example, 4 y after an earthquake in Turkey, prevalence of PTSD was higher among relocated (28%) compared with non-relocated adults (15%), but relocation status did not predict traumatic stress.[37] Similarly, studies 2 mo after the 2004 tsunami in Thailand showed that the prevalence of PTSD and anxiety was higher among displaced compared with non-displaced adults (PTSD=12% vs 7%, anxiety=37% vs 30%), but displacement status did not predict PTSD or anxiety in multivariate analyses.[38] Finally, prevalence of PTSD 2.5 y after the Armenian earthquake was equally high among women who stayed in the affected region (92%) compared with those who were displaced to the capital in the days after the earthquake (89%).[39] Similar studies among children and adolescents showed that forced relocation did not predict differences in PTSD symptoms following the Armenian earthquake,[40] Hurricane Mitch in Nicaragua[41] or the 2004 tsunami in Thailand.[42] Displacement represents only one of the major burdens that families in LMICs face during natural disasters and exposure is stressful even for non-displaced populations.
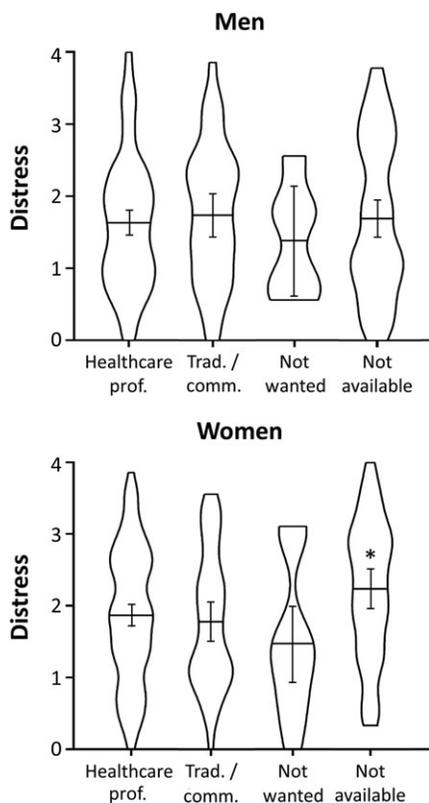
Figure 1. Adjusted mean distress scores for men and women by psychosocial support group. *p-value for difference <0.05 compared with every other group. Error bars reflect 95% confidence intervals for the adjusted means. (A) Men: adjusted for age (y) and education (y). (B) Women: adjusted for age (y).

Assessment of psychosocial health interventions following displacement or disasters is complicated by selection bias: those with higher distress levels might be more likely to seek and use psychosocial health services. However, our data highlight that women who report lacking such resources have greater distress. This might reflect the efficacy of the intervention, with an amelioration of distress symptoms among people who access available services compared with those who report no available services. It is also possible that women who already had high distress experienced difficulty accessing services or that they perceived a greater lack of services than others. The lack of services might also represent a source of distress above and beyond that associated with experiences related to the disaster and displacement. Finally, it is possible that women with high distress might be less likely to note sources of traditional and community support received, and thus be incorrectly classified in the Not available group rather than the Traditional/community group. Without a control group for comparison, we cannot identify the causal relationships underlying higher distress among women who report a lack of support. However, women are already vulnerable to distress in situations of natural disasters and displacement,[9,14] and our results highlight a group at further risk which may need to be targeted in future interventions.

The use of both healthcare professional and traditional support systems, and the similar patterns of distress between the two groups, highlight that multiple pathways are available to promote psychosocial health in LMICs following disasters. In particular, whereas healthcare professional support was widely used in the sample (57% of participants), traditional and community networks were a source of support for 45% of participants, and the only source reported by 18% of participants. Many successful intervention strategies in LMICs capitalize on these networks through 'train the trainer' programs, in which local and international mental health professionals train local non-specialists to provide mental health services.[43] The successful implementation of such programs following the 2010 earthquake in Haiti[44] and the 2004 tsunami in India[45,46] demonstrates that these programs can have a positive impact on symptoms of distress and represent an especially important network where mental healthcare infrastructure is limited. Local non-specialists, who might themselves be survivors of disaster or displacement, are well positioned to adapt to the cultural and environmental context and might be an important first source of support for individuals who do not want to or cannot access other services.[44,45] Such networks can also lay the foundation for the development of more extensive mental health services that can be sustained even in resource-poor settings.[16]

Conclusions

Women are already disproportionately affected by distress due to exposure to natural disasters and associated displacement, and those who report a lack of psychosocial support might be at even greater risk. Healthcare professional and traditional community support networks present complementary pathways for provision of psychosocial support that might be mobilized following disasters or displacement. Given the prevalence and severity of natural disaster exposure and displacement in LMICs, the development of effective and sustainable mental health intervention pathways represents a priority for future research.

Supplementary data

Supplementary data are available at *International Health* online (http://inthealth.oxfordjournals.org).

communities and homes, and who completed the survey themselves, then encouraged and aided their peers to complete the survey as well.

Competing interests: The authors declare that they have no competing interests.

Ethical approval: All procedures performed in studies involving human participants were in accordance with the Helsinki declaration of the World Medical Association.

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