

A National Study of Health Care Service Utilization and Substance Use After the 2010 Chilean Earthquake

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Objective: A national epidemiological survey in Chile assessed adaptive (health care utilization) and maladaptive (substance use) postearthquake behaviors. **Methods:** Three months after the 8.8-magnitude 2010 Bio-Bio earthquake, face-to-face interviews were conducted with a representative sample of 2,108 adults. Logistic regression analyses examined predictors of health care service utilization and substance use. **Results:** Few participants utilized available government- and community-based psychosocial resources (16.6%). A minority reported increased substance use (13.2%). Lower self-efficacy was correlated with increased health care utilization (odds ratio [OR]=.92, 95% confidence interval [CI]=.88–.96) and use of tranquilizers, illicit and psychotropic drugs, and alcohol (OR=.95, CI=.91–.99); this pattern was not limited to residents of areas with the heaviest impacts. **Conclusions:** Self-efficacy beliefs elucidate variability in survivors' behaviors postdisaster and may provide an avenue to encourage salubrious responses. Postdisaster interventions

should broadly target the population; those less heavily affected may need, and be as likely to use, available resources. (*Psychiatric Services* 65:1392–1395, 2014; doi: 10.1176/appi.ps.201300500)

The February 27, 2010, 8.8-magnitude earthquake in Chile—the Bio-Bio earthquake—was the sixth largest ever recorded (1). Over 1.8 million Chileans were affected; 523 died, 12,000 were injured, and over 800,000 were displaced from their homes. To mitigate potential deleterious psychosocial consequences, the Chilean government offered a variety of outreach efforts, including community-based health care services (such as helplines and clinics) and workshops for families. Use of these services is largely unexplored.

After community disasters, some individuals may need or desire health care services, yet available resources are infrequently utilized (2). Residents may instead turn to maladaptive behaviors, including substance use, which is often comorbid with psychopathology (3) and which may exacerbate existing health problems or precipitate new ones (such as addiction) and thus impair community reconstruction efforts. Furthermore, after a disaster, general medical and mental health problems may extend beyond the regions with the heaviest impacts (4,5). Individuals living in more distant regions may also engage in maladaptive behaviors and may need

health care services. However, many postdisaster studies focus only on directly affected areas (5,6). Identifying predictors of postdisaster adaptive and maladaptive behaviors throughout an affected population may bolster the efficacy of postdisaster interventions.

Examining the presence of psychological resources, such as self-efficacy, may help clarify variability in adaptive and maladaptive postdisaster behaviors (7,8). Self-efficacy involves a person's self-perceived ability to cope effectively with stressful events and the belief that actions produce tangible results, even in threatening situations (9,10). Individuals with low self-efficacy may feel unable to handle stressful circumstances that may occur after a disaster and may seek external resources, both salubrious and maladaptive, to facilitate coping. Indeed, self-efficacy has been associated with psychological adjustment and recovery from substance abuse after traumatic events, including natural disasters (7,8). Yet few studies have used population-based samples to examine the association between self-efficacy and adaptive and maladaptive behaviors after large-scale disasters. Such research may benefit relief efforts and postdisaster outreach.

We examined rates of health care service utilization and substance use in a representative sample shortly after the 2010 Bio-Bio earthquake. Self-efficacy was examined as a predictor of these behaviors. We hypothesized that individuals with lower self-efficacy, who may feel unable to independently

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cope with the disaster, would be more likely to rely on health care services and substance use and would thus report greater adaptive and maladaptive behaviors.

Methods

Ipsos Public Affairs compiled a representative sample of Chilean individuals ages 15 to 90, oversampled near the earthquake's epicenter. Data were collected from May 13 to June 7, 2010, via 2,108 face-to-face interviews conducted in Spanish and each lasting 35 to 40 minutes. Sampling maps were designed by using military topographic maps and census data from the Chilean National Statistics Institute. Quota sampling methodology determined household and participant eligibility (one participant per household). Random Map Selection Software was implemented in Santiago to account for the large number of apartment dwellers. Region of residence was recorded as the epicenter region (Concepción, Talcahuano, Tomé, Lota, and Talca) or outside the epicenter (Santiago metropolitan area, North, Central, and South).

Professionally trained Ipsos staff obtained oral consent and then conducted the interviews. Demographic information included age, gender, and marital status. Economic disadvantage was assessed via the Chilean E&E Socioeconomic Classification, a composite of employment status and education level of household head. Pre-earthquake physician-diagnosed anxiety or depressive disorder was ascertained. Methods were approved by the institutional review boards at the University of California, Irvine and the Universidad Andrés Bello, Santiago, Chile. [Full details of the methodology are available in an online supplement to this report.]

Participants reported on service utilization after the earthquake: reading pamphlets or articles; calling helplines; attending community-based workshops; visiting a psychiatrist, psychologist, or health care professional; or participating in a government-funded psychoeducational group. Responses were dichotomized: 0, no health care service use, and 1, used at least one type of service.

Participants reported whether they had used alcohol, tranquilizers, or other drugs (illicit or psychotropic) more than

usual since the earthquake (yes or no for each). Responses were dichotomized: 0, did not use substances; and 1, used drugs, alcohol, or tranquilizers more than usual. Self-efficacy was assessed via the Generalized Self-Efficacy Scale (10), a continuous measure assessing beliefs about one's ability to perform novel or difficult tasks and to cope with adversity. Distance of residence from the epicenter was calculated, and severity of earthquake destruction was assessed.

Data analyses were conducted with Stata, version 11.0. Poststratification weights were constructed according to gender, age, and region as indicated by 2010 National Statistics Institute census estimates. Because of oversampling in the epicenter region, separate weights were constructed for participants at the epicenter on the basis of age, gender, and province (a subcategory of region).

Incidence of health care service utilization and substance use were calculated. Next, two multivariate logistic regression analyses examined predictors of health care utilization and substance use. Self-efficacy, demographic factors, and prior mental health conditions were included as potential indicators. To explore impact of severity of exposure to the earthquake, analyses were conducted separately with region of residence, distance from the epicenter (both categorical and continuous), and reported destruction as predictors. The pattern of results did not change, and results are presented using region of residence for ease of interpretation.

Results

A total of 2,108 interviews were conducted. Among participants, 52% (N=1,096) were female, 48% (N=1,012) were male. The mean age of the sample was 40±17.2 years. Married individuals accounted for 44% (N=921) of the sample; 13% (N=282) were widowed, divorced, or separated; and 43% (N=900) were single. Forty-eight percent (N=1,004) of the sample were from the epicenter region, 14% (N=299) from the Northern region, 17% (N=351) from the Central region, 9% (N=199) from the South, and 12% (N=255) from Santiago. In terms of mental disorders, 11% (N=231) reported a history of either depression or anxiety, 6% (N=126) reported prior diagnoses of both anxiety and depression, and 83% (N=1,751) had

no history of a physician-diagnosed mental disorder. The mean self-efficacy score was 33.7±5.8 (possible scores range from 10 to 40, with higher scores indicating the individual's stronger belief in self-efficacy).

Table 1 presents data on postearthquake health care service utilization and substance use for the entire sample and by region. In adjusted models, health care service utilization was associated with lower self-efficacy (odds ratio [OR]=.92, 95% confidence interval [CI]=.88-.96, $p<.001$). No demographic factors or prior mental disorders were significant predictors of health care utilization. In adjusted models, a greater likelihood of substance use was associated with having a prior mental disorder (OR=2.77, CI=1.91-4.02, $p<.001$), being economically disadvantaged (OR=1.33, CI=1.02-1.73, $p=.034$), having no spouse present (OR=1.97, CI=1.08-3.58, $p=.026$), and having lower self-efficacy (OR=.95, CI=.91-.99, $p=.029$). Participants who reported any postdisaster health care utilization were almost three times as likely to report use of at least one type of substance (OR=2.70, CI=1.47-4.98, $p=.001$). Some regional differences were associated with utilization and substance use. For example, individuals in the South (a rural area a mean distance of 520±81 km from the epicenter) were significantly less likely than those in the epicenter to use health care services (OR=.46, CI=.26-.81, $p=.007$) and substances (OR=.31, CI=.15-.68, $p=.003$). However, compared with those in the epicenter, residents of Santiago were just as likely to report health care service utilization and substance use. [A table presenting results of these analyses is available in the online supplement.]

Discussion

Although a variety of health care services were available after the Chilean earthquake, utilization was infrequent. Because individuals may show persistent disaster-related negative general medical and mental health consequences years after a disaster (5), public service efforts should offer and encourage use of services over time. The media may also help promote awareness of services and methods to increase resiliency (11). Outreach efforts should account for psychological variability in the population:

Table 1

Health care utilization and increased substance use by 2,108 adults in the three months after the 2010 Bio-Bio earthquake in Chile, by region

Variable	Epicenter region (N=1,004)			Nonepicenter region (N=1,104)			All regions (N=2,108)		
	N	Weighted %	Unweighted %	N	Weighted %	Unweighted %	N	Weighted %	Unweighted %
Health care utilization									
Primary health care visits	93	9.5	9	56	7.6	5	149	7.8	7
Community mental health care visit	32	3.2	3	34	4.2	3	66	4.1	3
Hospital psychiatric service ^a	8	.6	<1	22	2.8	2	30	2.6	1
Read articles or pamphlets	55	5.7	5	57	6.6	5	112	6.6	5
Called helpline	8	.1	<1	2	.3	<1	10	.3	<1
Attended adult community workshop	11	1.1	1	23	.9	2	34	.9	2
Used any of the above health care services	157	15.9	16	132	16.6	12	289	16.6	14
School-age household member attended JUNAEB workshop ^b	43	4	4	71	5.6	6	114	5.4	5
Substance use									
Increased drinking	42	4.3	4	41	4.7	4	83	4.7	4
Increased drug use	6	.6	<1	4	1	<1	10	1	<1
Took tranquilizers	86	8.5	9	59	8.3	5	145	8.5	7
Any increased substance use	120	12.0	12	97	13.1	9	217	13.2	10

^a Utilization differed significantly ($p < .001$) between the epicenter and nonepicenter regions.

^b JUNAEB, Chilean National Board of Assistance and Scholarship. Utilization differed significantly ($p < .05$) between the epicenter and nonepicenter regions.

efforts targeted toward people with low self-efficacy could promote the use of adaptive behaviors (health care service use) as an alternative to maladaptive ones (substance use). Appeals to people with higher self-efficacy could frame use of health care services as a type of self-directed behavior that can help alleviate disaster-related distress.

These results support research suggesting that a small percentage of people may increase use of substances after natural disasters (12). Health care professionals should be cognizant of this possible increase and the potential comorbidity between substance use and other psychopathology and treat them concurrently (3). Community-level interventions to curtail substance use after disasters may also help speed community recovery (13).

Results indicate that individuals with lower self-efficacy were more likely to engage in both adaptive and maladaptive behaviors; this pattern was not limited to residents of areas with the heaviest impacts. Of note, residents of some rural areas reported less service utilization, congruent with research indicating access and transportation as a barrier (4). However, economic disadvantage was not associated with outcomes—perhaps because of the Chilean government's

attempts to distribute postdisaster resources to all communities regardless of socioeconomic status. Nonetheless, targeting self-efficacy may help curtail deleterious choices and promote adaptive choices (7). Brief self-efficacy assessments could be incorporated into postdisaster intake screenings, and the results could inform psychological first-aid activities, such as individual and group interventions (14). Service providers could work to increase feelings of self-efficacy, building survivors' psychological capital (such as social support) and capacity to manage disaster-related stressors positively (such as cognitive reframing). This could be achieved by facilitating mastery experiences (such as filling out insurance forms) or by enhancing feelings of control (such as goal setting). Providers could also screen for substance use among treatment seekers and offer appropriate resources.

Individuals obtaining treatment for their own or their family members' disaster-related physical injuries may also be a good population to assess for potential substance use or other problems. Physician referrals tend to increase the likelihood of additional, malady-specific, health care service use (15). Although having a prior mental disorder

did not predict postdisaster service use, people without an official diagnosis of a mental disorder may be symptomatic but may not seek formal assistance (2). Furthermore, preexisting mental health problems may be exacerbated after a disaster, leading to increased substance use or substance use disorders and to disorders that are difficult to treat (such as posttraumatic stress disorder) (5). Use of mental health services may mitigate such risks.

Although we obtained useful information shortly after a devastating natural disaster, the study had several limitations. We used self-report measures for health care service use, substance use, and prior physician-diagnosed mental disorders. Corroborating reports from doctors and agencies would strengthen findings. Our study was cross-sectional and cannot support causal inferences or document behaviors over time. Availability of and motivation for seeking services was not assessed, and we did not assess domain-specific self-efficacy (9), such as individuals' beliefs about their abilities to overcome specific trauma-related obstacles (such as relocation and material loss). Finally, our participation rate was lower than ideal, although higher than the 20% that is

typical in face-to-face survey assessments in South America (personal communication, Vásquez J, 2013).

Conclusions

This study is unique in that it assessed a representative sample of individuals in Latin America after a devastating natural disaster. Designs that include postdisaster representative samples are essential for making evidence-based recommendations for postdisaster resource allocation, yet they are rarely implemented. Postdisaster studies in Latin America are exceedingly rare. Findings highlight the potential to capitalize on psychological resources such as self-efficacy to promote positive adjustment. Lack of a dose-response relationship between geographic proximity and outcomes suggests that communities should prepare to distribute postdisaster resources widely; individuals in areas that are affected less heavily may also need resources and may be as likely to use them. These findings may help inform preparation efforts and postdisaster interventions to facilitate a quicker return to pre-disaster functioning.

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