Int. J. Ment. Health, Vol. 19, No. 2, pp. 3–20
M. E. Sharpe, Inc., 1990

BRUNO R. LIMA, HERNAN SANTACRUZ, JULIO LOZANO, HERNAN CHAVEZ, NELSON SAMANIEGO, MARIA SILVIA POMPEI, AND SHAILA PAI

Disasters and Mental Health: Experience in Colombia and Ecuador and Its Relevance for Primary Care in Mental Health in Latin America

Disasters are extraordinary, but relatively frequent, events that entail huge material losses and can result in death, physical injury, and human suffering [1]. This definition has been complemented by Quarantelli [2], who defines disasters from the sociological perspective as "crisis situations in which demands exceed resources." What is clear is that a disaster is not a technological accident or a natural event, but is the impact of that accident or that event on a human community. What defines the magnitude of a disaster is not the magnitude of the event, but the magnitude of its human and material consequences. Since a human being is by nature a biopsychosocial organism, the effects of disasters must be evaluated on those three levels (bio-psycho-social) as the framework for providing for the victims the health care necessary for the prevention, detection, and management of physical, psychological, and social sequelae.

The importance of such events for mental health professionals has been under-

---

Bruno R. Lima is an Associate Professor of Psychiatry and Mental Hygiene, Community Psychiatry Program, The Johns Hopkins Medical Institutions, Adolf Meyer Building, Room 144, 600 North Wolfe St., Baltimore, MD 21205, USA. Hernan Santacruz is an Assistant Professor, Department of Psychiatry, School of Medicine, Javerian University, and Head of the Mental Health Unit, San Ignacio Hospital, Bogota, Colombia. Julio Lozano is an Assistant Professor, Department of Psychiatry, School of Medicine, Javerian University, and Chief, Mental Health Section, Health Service of the Department of Tolina, Ibague, Colombia. Hernan Chavez is an Assistant Professor, Mental Health Area, School of Medicine, Central University of Ecuador, and an officer in the National Division of Mental Health, Ministry of Public Health, Ecuador. Nelson Sameniego is a Chief Professor, Mental Health Area, Department of Psychiatry, School of Medicine, Central University of Ecuador, and Chief, National Mental Health Division, Ministry of Public Health, Ecuador. Maria Silvia Pompei is an Assistant Professor, Department of Psychiatry, School of Medicine, University of the State of São Paulo, Botucatu, São Paulo, Brazil. Shaila Pai is a Research Associate, Community Psychiatry Program, Johns Hopkins University, Baltimore, MD, USA. Translated by Michel Vale

The original Spanish version of this paper will appear in R. Alarcon & A. Valencia (Eds.), *Libro para el Dr. J. Mariategui*. Lima, Peru: Editorial Okura. In press.

scored by the systematic identification of their emotional consequences [3–5]. These consequences have been studied in various types of disasters, including floods [6], tornadoes [7], fires and explosions [8–11], hurricanes [12,13], volcanic eruptions [14–16], earthquakes [17–19], and other accidents [20–24]. The emotional problems of the victims may vary considerably.

Traditionally, it is estimated that 70%–75% of the victims will present transitory symptoms of anxiety and depression; 5%–10% will display serious syndromes with psychotic symptoms; and 10%–15% will remain relatively unaffected [25]. The most frequent psychiatric diagnoses have been anxious-depressive syndromes: post-traumatic stress syndrome, major depression, and generalized anxiety [15]. On the basis of these findings, many initiatives have been undertaken to provide mental health services to the victims; but these efforts have been concentrated in the specialized sector of mental health and in the most immediate postimpact period. Recognition that disasters may have long-term consequences and that the active participation of other health professionals or community leaders and organizations is necessary for the management of the resulting psychosocial problems has not yet been translated effectively and systematically into practice [25].

A biopsychosocial approach to, and long-term management of, victims of disasters underscore the importance of having mental health services provided by health workers who are not necessarily specialists in mental health, especially at the level of primary care. Primary care in health has been accepted as the key strategy for achieving the objective of "Health for all by the year 2000," a reflection of the growing awareness of its role in extending the accessibility of health services [26].

The importance of mental health in primary care has been demonstrated in various studies that have revealed a high frequency of emotional disorders in patients at primary care centers in both developed [27,28] and developing [29] countries. It has been found that 28% of these patients present significant mental or psychosocial problems [30,31] for which there are adequate methods and means of management [32]. These observations have given rise to numerous efforts to integrate mental health into general health care [33,34], including the development of the skills, knowledge, and attitudes in primary care workers (PCWs) that will enable them to intervene effectively in routine situations [35].

Mental health care for the victims of disasters, especially over the middle and long term, also requires inclusion of mental health in general health, but PCWs have not been involved in this process in a systematic way [36]. As a result, these two lines of activity—primary mental health care and care in disasters—have not been combined, which is surprising for a number of reasons:

1. Natural events are especially frequent in the developing countries [37]. Moreover, these events cause more human and material losses there because of the great vulnerability of these countries to the violence of nature—i.e., underdevelopment very often transforms natural events into disasters. This situation is expected to worsen on the American continent because of explosive urbanization and the progressive deterioration of socioeconomic conditions [38]. Technological developments, with scant safety measures, have added major

problems, as exemplified by the technological disaster in Bhopal, India [39].

Excluding disasters in the United States, in this century disasters have caused 1.' billion victims in the world, 97% of them in the Third World. There have been 26' disasters in South America, causing 165,000 deaths and affecting 78 million people This translates into an average of 624 deaths and 296,000 victims per disaster; thus for each death, there are about 500 victims whose psychosocial problems must b adequately managed [40].

2. Disasters have especially dire effects on people in the lower socioeconomi strata, who have less access to health resources in general and, in particular, t sparse and insufficient mental health resources [41]. For them, primary care is th only adequate strategy.

3. The victims of disasters do not see themselves as psychiatric patients [42], bu as individuals under stress. They more readily seek health care in general clinic than in mental health services [43].

4. It has been amply documented that PCWs can be trained to provide effectiv mental health services in routine clinical situations [32].

5. Mental health interventions for disaster victims over the middle and long tern must conform to the health policies of their respective governments, which pursue a strategy of primary care according to the principles promulgated by the Worl Health Organization (WHO) [44].

The discrepancy between mental health interventions in routine situation (which emphasize primary care) and in disaster situations (which stress the spe cialized sector) has diminished because of the various initiatives we have evolve as a result of the volcanic eruption in Armero, Colombia, and of the earthquakes i Ecuador. This paper describes the origins of this project, the results of the investi gation, the training, assistance, and planning activities, and, finally, future activi ties stemming from these initiatives.

THE ARMERO-ECUADOR PROJECT

On 13 November 1985, a flood caused by an eruption of the Nevado del Ruiz volcan in the central range of the Colombian Andes destroyed the city of Armero. Eight percent of its 30,000 inhabitants perished [45]. It was hypothesized that because of it characteristics and its magnitude, this disaster would probably entail major emotiona problems for the victims over the short and the long term [46]. Second, the mental hospita in Armero, which served a regional catchment area, was lost in the tragedy; it had ac counted for 87% of the psychiatric beds in the Department of Tolima. Also, 4(mental health workers were lost [47]. These two factors—a probable increase in menta morbidity of the victims and a reduction in specialized mental health resources—led to th development of alternative strategies for providing for the victims the care their emotiona problems required. To achieve this aim, various activities were developed around th Armero tragedy in the areas of investigation, training, assistance, and planning [48]. I March 1987, earthquakes in the north of Ecuador offered an opportunity to continu and broaden these lines of activity and to expand the areas of investigation and training.

Thus, the various stages of this Armero-Ecuador project included: (*1*) identifying the frequency of emotional disorders in disaster victims; (*2*) developing strategies and materials for mental health training of PCWs in disaster situations; (*3*) offering mental health care to the victims, and coordinating and reinforcing the activities of the special mental health sector and those at the level of primary care; (*4*) extending this experience to other Latin American countries; (*5*) developing national policies for mental health care in disasters that reflect the realities of our continent. In what follows we shall present a summary of the activities carried out in Armero and Ecuador with respect to investigation, training, assistance, and planning.

The investigation[1]

The principal object of our investigation was to shed light on the role of PCWs in providing mental health services to adult victims. This objective has been partially achieved through a study that will be described in what follows and that is summarized in the table. The studies in Armero (camps and clinics) and in Ecuador have the same basic design: a survey of a sample of subjects with an instrument that detects nonspecific emotional disturbances, and a psychiatric interview to establish a definitive diagnosis. In the clinics, the diagnoses of the PCWs were compared with the findings of the survey to evaluate their ability to detect correctly patients with emotional disorders.

The camps in Armero

The first step in establishing the need to involve the primary sector in mental health care of the victims of disasters was to determine the frequency of mental disturbances in such a population (Figure 1). Thus, 7–10 months after the Armero tragedy, a survey of 200 adult victims lodged in 4 camps in the area of the disaster was undertaken. The survey was made by mental health professionals: two psychologists, one psychiatric nurse, and one occupational therapist. A questionnaire was given to the victims to obtain information about their sociodemographic characteristics, their experience of the disaster, their physical and emotional complaints, the environment in the camps, and the social support received. This instrument included a self-reporting questionnaire (SRQ) whose validity had been well demonstrated in developing countries [50] (see the Appendix).

Fifty-five percent of the victims were found to suffer from emotional disorders, a rate four to five times higher than that identified in routine situations using the same instrument. Despite the facts that we did not survey a control group and had no predisaster data, such a large difference indicates an association between the disaster and/or the difficult social conditions following it and the observed mental morbidity rate. It was found that the most frequent symptoms were of an anxious nature ("being nervous, tense, or worried"; "being easily frightened"), and that the symptoms that most commonly signaled the presence of

Summary of the Armero-Ecuador Project

	Armero		Ecuador
	Camps	Clinics	Clinics
1. Objective	To determine frequency of emotional disorders in the community (need)	To determine frequency of emotional disorders among patients at health services (demand) Detection by PCW*	To determine frequency of emotional disorders among patients at health services (demand) Detection by PCW Response of PCW to training
2. Design	Descriptive, analytic	Descriptive, analytic	Descriptive, analytic, experimental
3. Subjects	Homeless victims, directly affected	Victims and nonvictims of the affected communities	Victims and nonvictims in affected communities
4. Sample Surveyed Interviewed	 200 104	 100 50	 150 41
5. Instruments	SRQ** Clinical interview List of symptoms from DSM-III Mini-mental interview	SRQ Clinical interview List of symptoms from DSM-III HWE***	SRQ Clinical interview List of symptoms from DSM-III HWE
6. Principal dependent variables	Emotional disorder Psychiatric diagnosis Cognitive disorder	Emotional disorder Psychiatric diagnosis Detection by PCW	Emotional disorder Psychiatric diagnosis Changes in detection of cases by the PCW as a function of training
7. Intervention	None	None	PCW training

*PCW = primary care worker; ** SRQ = self-reporting questionnaire; ***HWE = health worker evaluation.

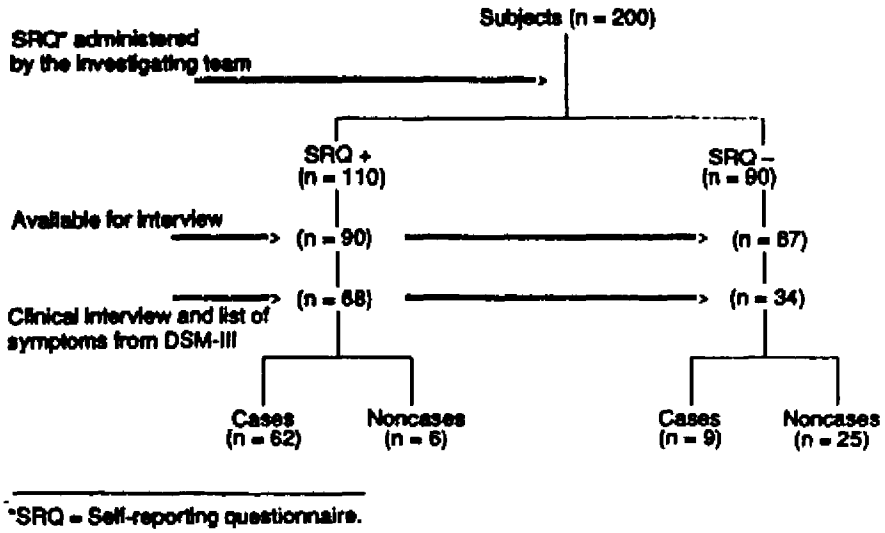

Figure 1. Armero camps.

an emotional disorder were of a depressive nature ("feeling unable to play a useful part in life"; "feeling tired all the time") [51].

But the SRQ indicates only that a subject with a positive score is emotionally distressed; it does not specify whether the person actually has a definite mental disorder, or what that disorder might be. To evaluate the severity and the type of emotional disorders identified by the SRQ, a psychiatrist administered to a subsample of the victims (n = 104) a semistructured interview to which was added a list of symptoms for establishing diagnoses in accordance with the criteria in the *Diagnostic and statistical manual of mental disorders* (3rd ed.) (DSM-III) [52]. To ensure the validity of the diagnosis, only a subject whose diagnosis was established by a clinician in accordance with his own criteria and confirmed by the criteria of DSM-III was considered a "case." Using these conservative and standardized criteria, we found that the most frequent diagnoses were post-traumatic stress disorder and major depression.[2]

These findings underscore four basic points:

1. The prevalence of emotional disorders in victims lodged in camps for 7–10 months after a major disaster was very high (55%).

2. These emotional disturbances met conservative criteria for a formal psychiatric diagnosis.

3. The diagnoses revealed affective disorders of anxiety and depression, but without psychotic symptoms.

4. The SRQ proved to be a valid instrument in disaster situations, with adequate sensitivity (87%), specificity (60%) and positive predictive power (75%)

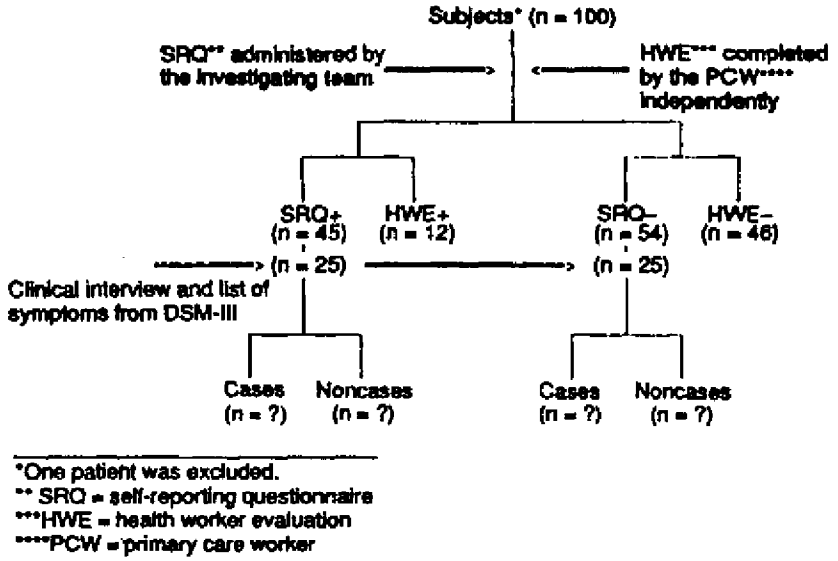

Figure 2. Armero primary care clinics.

The clinics in Armero

The next question asked was: Although the frequency of emotional disorders in the "community" (i.e., camps) is high, will it be found to be high also among patients who visit primary care centers in the disaster area?

To address this question, a project similar to that carried out in the camps was designed: 12 months after the disaster, adult patients were surveyed in 2 primary care clinics to determine the frequency of emotional disturbances (Figure 2) [53]. At the same time, a study was undertaken to determine whether PCWs identified these problems adequately. A systematic sample of 100 patients was obtained in the 2 clinics. The patients were surveyed during their visits to the clinic in such a way that administering the questionnaire did not influence the content or the process of the medical interview. The surveyors were mental health workers who had been familiarized with the instrument.

The same questionnaire (SRQ) that was used in the camps was administered to the patients. The PCWs were all doctors who were working at the health centers at the time of the investigation. The doctors filled out a small questionnaire after each visit for each patient participating in the study about the problems he or she presented; the questions focused on whether the patient had solely a physical problem, solely an emotional problem, both, or neither. The doctor was regarded as having identified emotional problems in his patient if he stated that the patient presented an emotional problem, whether in isolation or associated with a concomitant physical problem.

The SRQ revealed a prevalence of emotional disturbances of 45%. However, the PCWs did not identify 74% of these patients as being emotionally affected. It is noteworthy that the PCWs did not detect emotional disorder in 88.2% of the patients who said they felt worthless, in 68.8% of those who reported crying more than usual, or in 62.5% of those who felt that they were unable to lead a useful life. It is also important to note that the PCWs did not identify an emotional problem in 80% of the 10 patients who reported having thought of suicide.

The most frequent emotional symptoms according to the SRQ were predominantly anxious symptoms ("feeling nervous, tense, or worried," "feeling easily frightened"). The symptoms that were most indicative of an emotional disturbance were of a depressive nature ("crying more than usual," "feeling unable to play a useful part in life," "feeling a worthless person").

A subsample of 50 patients was given a psychiatric interview identical with that given in the camps, but analyses of these data have not yet been completed.

The three principal conclusions at this stage of the investigation are:

1. The frequency of emotional disorders in adult patients at health centers in the area affected by a major disaster is very high.

2. PCWs without special training in mental health in disaster situations identified only a fourth of the patients with emotional disorders, including those who thought about suicide.

3. The inability of the PCWs to respond to the emotional problems of their patients underscores the need to provide adequate mental health training.

The clinics in Ecuador

The disaster in Armero was an extreme situation, and the applicability of our findings to disasters of lesser magnitude might be questioned. Hence, it was important to replicate our initial investigation, utilizing the same instruments, in a less serious disaster. In Armero, moreover, no intervention was undertaken. The earthquakes in Ecuador offered an opportunity to replicate the investigation at Armero and to undertake an intervention.

On 5 and 6 March 1987, the north and north-east of Ecuador were shaken by a strong earthquake, which caused extensive material damage and loss of life, especially in the province of Napo. But, owing to the better resources in general health existing in the province of Imbabura and its better conditions in terms of communication and transport, it was decided to use this area for our study, although the impact of the disaster there was much less severe and resulted in no loss of life.

The Armero investigation was replicated in Ecuador, with a survey, using the SRQ, of a systematic sample of 150 adult patients at primary care clinics in the affected area (Figure 3). The prevalence of emotional disorders was 38%. The most frequent symptoms were, again, anxious in nature, and those most indicative of emotional disorder were of a depressive nature. Forty-one patients were also given a structured psychiatric interview identical with the instrument used in Colombia.

The intervention consisted of a short training course in mental health and disas-

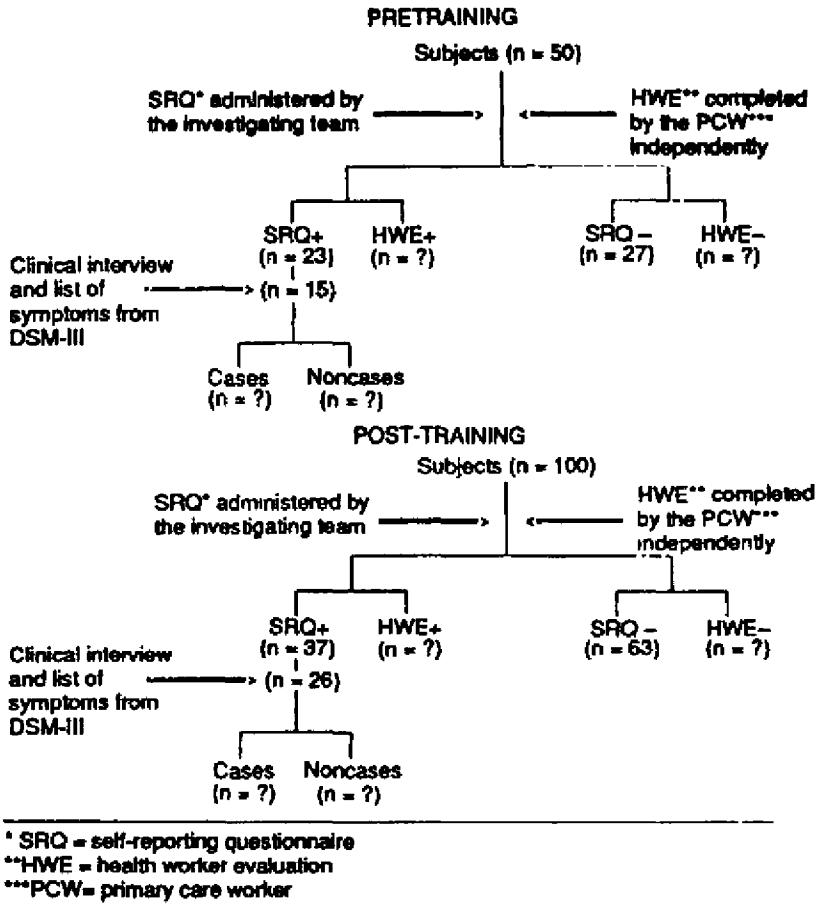

Figure 3. Ecuador: Pretraining findings.

ters given to PCWs, who, in this setting, were general doctors completing their "rural year." Changes in the clinical abilities and in the theoretical knowledge of the PCWs were evaluated. To evaluate changes in clinical abilities, the questionnaire previously used in Armero was administered to the PCWs before and after the short course to compare their identification of patients with emotional disorders with the findings of the SRQ. To evaluate their theoretical knowledge, one pretest and two post-test questionnaires were administered: immediately after the course, and at the end of the data collection.

Analyses of the effects of the training and of the psychiatric diagnoses recorded have not been completed, but the preliminary results indicate an increase in the correct identification of patients with emotional disorders. Moreover, the receptivity of the PCWs to the new information and the interest they exhibited were noteworthy; in fact, in addition to the ten doctors who participated in the investigation, the other doctors who were working in the area insisted on being included in the training.

Since the method of investigation was the same in both the Armero and the Ecuador studies, various comparisons can be made [54]. It is important to note that, with the exception of a higher proportion of women among the Ecuadorian subjects, there were no other significant sociodemographic differences among the samples. A comparison of the data obtained with the SRQ in these three groups of subjects (in Armero, victims in camps [n = 200] and patients at clinics [n = 100], and in Ecuador, patients at clinics [n = 100]) revealed the following:

1. The prevalence of emotional disorders was different in the three groups: in Armero the highest frequency (55%) was found among victims in the camps, who were directly and severely affected, and left homeless. An intermediate frequency (45%) was encountered in patients in the primary care clinics. This sample represented a combination of direct victims of the disaster and inhabitants of neighboring localities who, although not directly affected by the flood, lived in an atmosphere of great emotional tension caused by the continued risk of new volcanic eruptions, by socioeconomic problems, and by the disorganization of the community. The lowest rate (38%) was encountered in Ecuador, where there were no fatalities in the area we studied and the material losses were less severe. These findings suggest a direct association between the proportion of victims with emotional disorders and the magnitude of the disaster or the extent of their exposure to trauma.

2. The median scores on neurotic symptoms for these three samples are quite similar both for those with a positive score (in Armero, camps: 9.8±4.4, and clinics: 8.9±3.8; in Ecuador: 9.7±3.8) and for those with a negative score (3.4±2.1, 4.2±2.0, and 3.8±1.9, respectively). These findings indicate that, although varying numbers of victims may become emotionally disturbed as a result of a disaster, those who become ill present symptoms of similar intensity.

3. The analysis of the profiles of the neurotic symptoms of these three groups of subjects revealed an interesting parallel were indicating that the individual symptoms were more or less the same independently of the magnitude of the disaster or the level of exposure of the victims (Figure 4). Moreover, the most frequent symptoms and the symptoms that were the strongest predictors of emotional distress were consistently the same ones, being of an anxious and an depressive nature, respectively.

These findings empirically reinforce the following conclusions:

1. The frequency of emotional disorders among the victims of a disaster is proportional to the magnitude of the catastrophic event.

2. The level and the profile of the symptoms among victims with emotional distress are similar for victims of different disasters.

Training

The findings of our investigation indicate a consistency in the emotional response of disaster victims and provide an empirical base for the development of a model curriculum for use in different disasters, with adjustments for the culture, the needs, and the resources of the different countries. More or fewer PCWs will be trained depending on the magnitude of the disaster and the anticipated prevalence; but the

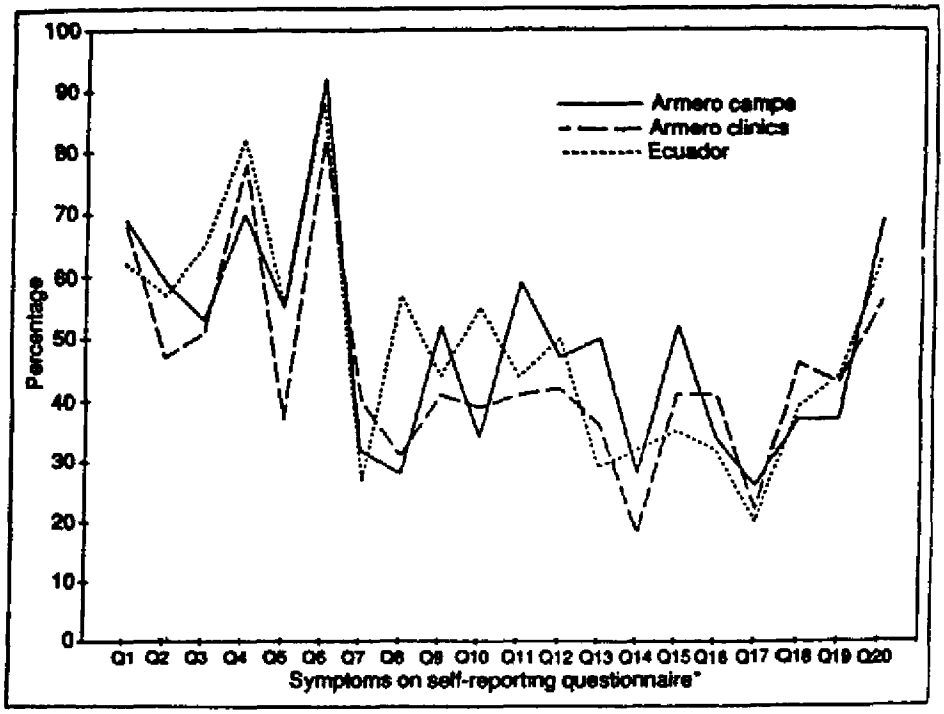

Figure 4. Symptom profile of victims with emotional disorders according to self-reporting questionnaire in camps (n = 111) and clinics (n = 45) in Armero and in Ecuador (n = 60).

content of the training can be uniform, focusing particularly on the clinical pictures of anxiety and depression.

In August 1987, a training course for doctors and members of the nursing profession was given in the north of the Department of Tolima, with financial support from UNICEF, under the National Survival Plan, and by the Pan American Health Organization/WHO Regional Office for the Americas, under the National Plan for Preparation for Emergencies, Urgent Situations, and Disasters of the Ministry of Health of Colombia. A manual on mental health care in disasters, with emphasis on the role of the PCW, was used in this course. The faculty of the course, professors and resident doctors in the Department of Psychiatry of the Javerian University and mental health workers in the Federico Lleras Hospital, added a special section for health professionals to this manual.

The content of the course concerned evaluation of the emotional state of disaster victims, their most frequent mental disorders (anxiety states, depression, and suicide, adjustment reactions, psychosomatic disorders, and drug dependence), the social aspects of the disasters, and the affective problems of children in these situations.

The manual has become part of a series of documents, produced in Colombia

[55], for managing disasters. A modified version has also been used in Ecuador, as a training tool in the investigation described above, and in Panama. It will also be used to train PCWs in Brazil with respect to the landslides that took place in Rio and Petropolis in February 1988.

Care

The findings of our investigation indicate the necessity of caring for the emotional disorders identified in the victims. In Colombia, a series of activities and strategies has been proposed to provide wide-ranging mental health care—preventive, therapeutic, and rehabilitative—to people in the community affected by the disaster. One purpose of these strategies has been to reinforce the mental health services in the Department of Tolima by providing them with psychiatric teams. Outpatient services have also been strengthened, both in the capital of the department and in various cities in the disaster area. With the opening of outpatient services in the northern area, it has been possible to maintain the policy of regionalization and to prevent all of the demand for services from devolving on the mental health unit in Ibague, with all the risks that that would have entailed.

Among the service delivery activities developed, we should note the deployment of treatment teams specifically for children and adolescents, psychological and psychiatric consultations, home visits, individual support, family groups, and the administration of drugs. Workers specialized in mental health have provided, to the extent possible, supervision and consultation for the PCWs, thus augmenting their activities in mental health.

Planning

The National Plan for Primary Care and Mental Health of Colombia has incorporated the experience accumulated in Armero with regard to disasters, mental health, and primary care. The plan defines the objectives, the population at risk, and the various activities of health promotion, prevention, treatment, and rehabilitation that PCWs can carry out [56].

The objectives of the mental health measures undertaken by PCWs in the disaster area are:

(1) to detect individuals, in the communities and in the health services, who present emotional problems as a reaction to the impact of the disaster, and to develop mental health care and rehabilitation activities; and

(2) to develop mental health activities as an integral part of all care activities provided to the victims over the short, medium, and long term.

The people who are vulnerable to developing emotional disorders and to whom the PCWs should provide care include:

(1) direct victims of the disaster, especially those affected by losses of family members, friends, or economic resources, or afflicted with physical handicaps;

(2) people not directly affected, but who have suffered loss of family members, friends, or economic resources, or who have physical handicaps;

(3) children, the elderly, the handicapped, and people with limited sociofamilial and economic services; and

(4) health workers associated with care and rehabilitation centers in disaster areas.

A PCW worker should undertake activities of public health information and prevention of disease, treatment, and rehabilitation. These activities will be different for the professional and the auxiliary PCWs.[3] Activities relative to education and the prevention of emotional disorders in disaster victims and the affected communities include:

(1) promoting educational measures for a community threatened by a disaster, managing the emotional problems frequently encountered (e.g., denial and anxiety);

(2) collaborating with other programs in the mental health sector and with other sectors, making mental health a part of the various activities necessitated by a disaster situation;

(3) coordinating mental health activities with other sectors of the community that participate actively in disaster relief, such as the Red Cross and Civil Defense;

(4) learning about the system of care developed for the disaster, the existing health and community services, and the mechanisms for gaining access to these resources; and

(5) developing in the community activities of solidarity and support in seeking a collective response to the disaster situation.

PCWs should also be trained to provide the necessary assistance to victims by early identification and effective management of their emotional problems (Figure 5). Auxiliary PCWs should use diverse means in the management of emotional problems of victims, including:

(1) ventilating anxiety and depression, and giving emotional support;

(2) facilitating access to other health services or community resources the victims may need;

(3) providing victims with objective information about the existing situation and attempting to obtain the information they seek; and

(4) involving family or friends in the care of the victims' emotional problems.

The auxiliary PCW should obtain the support of the professional PCW, discussing the management of the emotional problems of the victims under systematic supervision, seeking special advice, or referring the victim elsewhere when necessary.

The professional PCW should utilize various means in the management of victims who present emotional problems or who are sent to him by the auxiliary health worker; these include administration of the drugs required and evaluation of the physical state and sociofamilial situation of the victim. The professional PCW should, in turn, have the support of the specialized mental health worker, discussing with him the management of the emotional problems of the victims under systematic supervision, seeking specific advice, or referring these patients elsewhere when necessary.

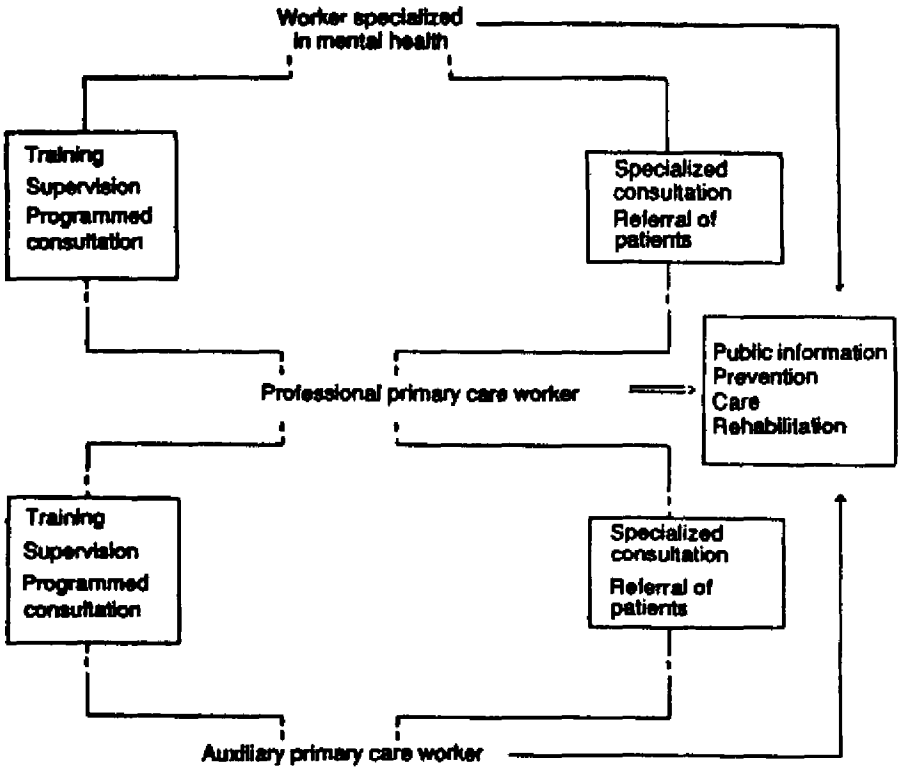

Figure. 5. Relation of sector specialized in mental health to primary care facilities.

The PCW will also carry out rehabilitative activities, though to a somewhat limited extent. He should maintain close ties with the victims and their affected family members and promote their social and work rehabilitation, optimize the utilization of existing resources, and reduce the incapacity caused by persistent emotional problems. The PCW should also promote acceptance of the victims by the communities in which they have been relocated.

Conclusions

The Armero-Ecuador project has permitted the development of various initiatives in disasters and mental health in Latin America, with emphasis on the primary care level. For the first time, these activities have had the systematization, coordination, follow-through, and dissemination required if any real impact is to be made in the areas of research, training, treatment, and planning.

The success of the project seems to be due to the theoretical and practical relevance of its research component, which is the product of various strategies—i.e., its clear service orientation, linking empirical findings with care of patients; its

close involvement in the training of health personnel; and its immediate influence on mental health programs for the victims of disasters. These multiple characteristics of the project have produced an interconnected initiative of great interest and relevance for administrators, planners, researchers, clinicians, teachers, and health workers.

The Armero-Ecuador project has also provided an impetus for consolidating the experience in disasters and mental health in the Latin American region [57] and on other continents.[4] Along these lines, various consultations have been provided to other Latin American countries in order to share our experience in Colombia and Ecuador, with the goal of designing national disaster mental health plans.[5] The empirical findings and the methodology of the research should become the basis for the design of more-sophisticated studies that might benefit from our efforts. We anticipate that the manual we produced will be modified, as needed, to meet local needs and resources, and that various countries will include a mental health component in their disaster plans and, conversely, that their mental health plans will include disasters as a priority concern.

Notes

1. The Armero project was the recipient of the 1987 ACTA Award from Foundation Acta, Buenos Aires, Argentina, which is given annually to the best research work done in psychiatry and mental health in Latin America.

2. B.R. Lima, S. Pai, H. Santacruz, et al. (1988) Primary mental health care in disasters: Armero, Colombia. The prevalence of psychiatric disorders among victims in tent camps. Working Paper Series, No. 62. Boulder, Colorado: Institute of Behavioral Science, University of Colorado.

3. In the "Plan," the PCW is defined as the various specialized health workers, professional or auxiliary, who participate in the development of mental health activities. These workers can be divided into two groups: (*1*) professional PCWs—general doctors, registered nurses, social workers, and occupational therapists who provide primary mental health care as part of their general health care services; and (2) auxiliary PCWs—nurse auxiliaries, social work auxiliaries, and health promoters who perform primary mental health tasks within the scope of the work in general health care.

4. See other articles in this issue.

5. B.R. Lima (1988) Informe de la consultoria brindada a las Divisiones de Salud Mental del Ministerio de Salud de Colombia y de la Secretaria de Salud del Estado del Rio de Janeiro, Brasil. Washington, DC: Organizacion Panamericana de la Salud; B.R. Lima (1988) Informe de la consultoria brindada a la Division de Salud Mental de Panama para capacitar funcionarios del programa nacional de salud mental en casos de desastres. Washington, DC: Organizacion Panamericana de la Salud.

References

1. Cohen, R.E., & Ahearn, F.L., Jr. (1980) *Handbook for mental health care of disaster victims.* Baltimore, MD: Johns Hopkins University Press.

2. Quarantelli, E.L. (1986) What is a disaster? The need for clarification in definition and conceptualization in research. In B. J. Sowder & M. Lystad (Eds.), *Disasters and mental health.* Washington, DC: American Psychiatric Press.

3. Kinson, W., & Rosser, R. (1974) Disasters. *Psychosomatic Research*, 1974, *18*, 437.
4. Bromet, E.G., & Schulberg, H.C. (1987) Epidemiologic findings from disaster research. In R.E. Hales & A.J. Frances (Eds.), *American Psychiatric Association annual review*. Vol. 6. Washington, DC: American Psychiatric Press.
5. Titchener, J.C., & Kapp, F.T. (1976) Family and character change at Buffalo Creek. *American Journal of Psychiatry*, *133*, 295.
6. Dunal, C., Gaviria, M., Flaherty, J., et al. (1985) Perceived disruption and psychological distress among flood victims. *Journal of Operative Psychiatry*, *16*, 9.
7. Logue, J.N., Hansen, H., & Streuening, E. (1980) Emotional and physical distress following Hurricane Agnes. *Public Health Reports*, *94*, 495.
8. Cobb, S., & Lindemann, E. (1943) Neuropsychiatric observations after the Coconut Grove fire. *Annals of Surgery*, *117*, 814.
9. Green, B.L., Grace, M.C., & Lindy, J.D. (1983) Levels of functional impairment following a civilian disaster. *Journal of Consulting and Clinical Psychiatry*, *51*, 573.
10. Leopole, R.L., & Dillon, H. (1963) Psycho-anatomy of disaster. *American Journal of Psychiatry*, *119*, 913.
11. McFarlane, A.C. (1984) The Ash Wednesday bush fires in south Australia. *Medical Journal of Australia*, *141*, 286.
12. Parker, G. (1975) Psychological disturbance in Darwin evacuees following cyclone Tracy. *Medical Journal of Australia*, *1*, 650.
13. Patrick, V., & Patrick, W.K. (1981) Cyclone '78 at Sri Lanka. *British Journal of Psychiatry*, *138*, 210.
14. Perry, R.N., & Hirose, H. (1983) Volcanic eruption and functional change. *Mass Emergencies and Disaster*, *1*, 231.
15. Shore, J.H., Tatum, E.L., & Vollmer, W.M. (1986) Psychiatric reactions to disaster. *American Journal of Psychiatry*, *143*, 590.
16. Cohen, R.E. (1987) The Armero tragedy. *Hospital & Community Psychiatry*, *38*, 1316.
17. Popovic, M., & Petrovic, D. (1964) After the earthquake. *Lancet*, *2*, 1169.
18. Langdon, J.R., & Parker, A.H. (1964) Psychiatric aspects of March 27 earthquake. *Alaska Medicine*, *6*, 33.
19. Infantes, V., Veliz, J., Morales, L., et al. (1970) Psychological observations in Ancash. *Revista de Neuro-psiquiatria*, *33*, 171.
20. Boman, B. (1979) Behavioral observations on the Granville train disaster. *Social Science and Medicine*, *13A*, 463.
21. Wilkinson, C.B. (1983) Aftermath of a disaster. *American Journal of Psychiatry*, *140*, 1134.
22. Lopes-Ibor, J.J., Soma, J., Canas, F., et al. (1985) Psychological aspects of the toxic oil syndrome catastrophe. *British Journal of Psychiatry*, *147*, 352.
23. Bromet, E.J., Parkinson, D.K., Schulberg, H.C., et al. (1982) Mental health of residents near the Three Mile Island reactor. *Journal of Preventive Psychiatry*, *1*, 225.
24. Srinivasa Murthy, R., & Isaac, M.K. (1987) Mental health needs of Bhopal disaster victims and training of medical officers in mental health aspects. *Indian Journal of Medical Research*, *86*, Suppl., pp. 51–58.
25. Lima, B.R. (1986) Primary mental health care for disaster victims in developing countries. *Disasters*, *10*, 203.
26. World Health Organization (1978) *Primary health care*. Geneva: World Health Organization.
27. Shepherd, M. (1967) *Psychiatric disorders in general practice*. London: Oxford University Press.
28. Regier, D.A., Goldberg, I.D., & Taube, C.A. (1978) The "de facto" US mental health service systems. *Archives of General Psychiatry*, *35*, 685.
29. World Health Organization (1975) *Organization of mental health services in developing countries (WHO Tech. Rep. Ser.*, No. 564). Geneva: World Health Organization.

30. Harding, T.W., De Arango, M.V., Baltazar, J., et al. (1980) Mental disorders in primary health care. *Psychological Medicine, 20*, 231.

31. Giel, R., De Arango, M.V., Climent, C.E., et al. (1981) Childhood mental disorders in primary health care. *Pediatrics, 68*, 677.

32. Srinivasa Murthy, R., & Wig, N.N. (1983) The WHO collaborative study on strategies for extending mental health care. *American Journal of Psychiatry, 140*, 1486.

33. Gulbinat, W. (1983) Mental health problems assessment and information support: Direction of WHO's work. *World Statistical Quarterly, 36*, 224.

34. World Health Organization (1973) *Psychiatry and primary health care*. Geneva: World Health Organization.

35. Harding, T.W. (1978) Task-oriented training in mental health. *African Journal of Psychiatry, 1*(2), 19.

36. Lima, B.R., Santacruz, H., Lozano, J., et al. (1988) Planning for health/mental health integration in emergencies. In M. Lystad (Ed.), *Mental health responses to mass emergencies: Theory and practice*. New York: Brunner/Mazel.

37. Seaman, J. (Ed.) (1984) *Epidemiology of natural disasters*. Basel: Karger.

38. Fumaro-Curtis, R. (1982) *Natural disasters and the development process: A discussion of issues*. Washington, DC: U.S. Agency for International Development.

39. Weiss, B., & Clarkson, T.W. (1986) Toxic chemical disasters and the implications of Bhopal for technology transfer. *Milbank Memorial Fund Quarterly, 64*, 216.

40. U.S. Agency for International Development, Office of U.S. Foreign Disaster Assistance (1986) *Disaster history. Significant data on major disasters worldwide, 1980-present*. Washington, DC: U.S. Agency for International Development.

41. Shapiro, S., Skinner, E., Kesler, L., et al. (1989) Utilization of health and mental health services. *Archives of General Psychiatry, 41*, 971.

42. Cohen, R.E. (1982) Intervening with disaster victims. In H.C. Schulberg & M. Killilea (Eds.), *The modern practice of community mental health*. San Francisco: Jossey-Bass.

43. Lindy, J.P., Grace, M.C., & Green, B. (1981) Survivors: Outreach to a reluctant population. *American Journal of Orthopsychiatry, 51*, 468.

44. Pan American Health Organization (1982) *Plan of action for the implementation of regional strategies* (Official Document No. 179). Washington, DC: Pan American Health Organization.

45. Gueri, M., & Perez, L.J. (1986) Medical aspects of the "El Ruíz," a volcanic disaster, Colombia. *Disasters, 10*, 150.

46. Lima, B.R. (1986) Asesoria en salud mental a raíz del desastre de Armero en Colombia. *Boletín de la Oficina Sanitaria Panamericana, 101*, 678.

47. Lozano, J.A. (1987) Resumen de la evaluación realizada en Armero. *Boletín Epidemiologico del Tolima, 4*, 12.

48. Lima, B.R., Lozano, J., & Santacruz, H. (1988) Atención en salud mental para victimas de desastres: Actividades desarrolladas en Armero, Colombia. *Boletín de la Oficina Sanitaria Panamericana, 104*, 593.

49. Lima, B.R., Santacruz, H., Lozano, J., et al. (1988) La atención primaria en salud mental para victimas de desastres: Armero, Colombia. *Acta Psiquiatrica y Psicologica de America Latina, 34*, 13.

50. Mari, J.J., & Williams, P. (1985) A comparison of the validity of two psychiatric screening questionnaires. *Psychological Medicine, 15*, 651.

51. Lima, B.R., Pai, S., Santacruz, H., et al. (1987) Screening for the psychological consequences of a major disaster in a developing country. *Acta Psychiatrica Scandinavica, 76*, 561.

52. Helzer, J. (1984) *DSM-III symptom checklist*. St. Louis: Washington University.

53. Lima, B.R., Pompei, M.S., Santacruz, H., et al. (1989) La deteccion de problemas emocionales por el trabajador de atención primaria en situaciones de desastre: Experiencia en Armero, Colombia. *Salud Mental, 12*, 6.

54. Lima, B.R., Chavez, H., Samaniego, N., et al. (1989) Disaster severity and emotional disturbance: Implications for primary mental health care in developing countries. *Acta Psychiatrica Scandinavica, 79,* 74.

55. Lima, B.R. (1987) *La atención primaria en salud mental para victimas de desastres. Manual para la capacitación del trabajador de atención primaria.* Bogota, Colombia: Ministerio de Salud.

56. Ministerio de Salud, Colombia (1987) *Plan de atención primaria en salud mental.* Bogota, Colombia: Ministerio de Salud.

57. Lima, B.R., & Gaviria, M. (Eds.) *Las consecuencias psicosociales de los desastres: La experiencia Latino Americana.* Monografia Clinica No. 2, Programa Simon Bolivar. Mexico. In press.

Appendix

Self-reporting Questionnaire

1. Do you have headaches ?
2. Do you suffer from lack of appetite ?
3. Do you have difficulty sleeping ?
4. Are you jumpy or on edge ?
5. Do your hands tremble ?
6. Do you feel anxious and troubled ?
7. Do you have problems with digestion ?
8. Do you have difficulty thinking clearly ?
9. Do you feel unhappy ?
10. Do you cry more than usual ?
11. Are you unable to enjoy what you do ?
12. Do you have difficulty making decisions ?
13. Is your daily work a burden ?
14. Do you feel unable to lead a useful life ?
15. Have you lost interest in things ?
16. Do you feel you are worthless ?
17. Have you thought about suicide ?
18. Do you always feel tired ?
19. Do you have unpleasant sensations in the stomach ?
20. Do you tire easily ?