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SCREENING FOR THE PSYCHOLOGICAL CONSEQUENCES OF A MAJOR DISASTER IN A DEVELOPING COUNTRY

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Screening for the psychological consequences of a major disaster in a developing country: Armero, Colombia

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ABSTRACT — Seven months following the volcanic eruption that destroyed the small town of Armero, 200 victims were screened for emotional problems with the Self-Reporting Questionnaire, a simple and reliable instrument. Fifty-five percent of the victims were found to be emotionally distressed. Variables associated with the presence of emotional distress included living alone, having lost previous job, feeling not being helped, not knowing date for leaving temporary shelter, being dissatisfied with living arrangements, complaining of non-specific physical symptoms or epigastric pain, and presenting several physical problems. The high prevalence of emotional distress supports the need to deliver mental care to disaster victims in developing countries through the primary level of care. Our findings provide guidelines for early detection of individuals at risk for developing emotional problems.

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Disasters are relatively common occurrences, but their impact on the psychiatric and psychosocial state of victims is still controversial. Some studies have suggested little or no negative effects (1-4), while some others have suggested significant consequences (5-15) which include long-term effects on victims (16) and effects specific to children (17,18). The controversial findings may be due to the differences in assessing certain characteristics of the disaster, such as the seriousness and level of the impact, the speed of onset, the duration of the disaster and the social preparedness of the community to handle such a disaster (19). Also the variations in the research methods utilized by different research groups, such as sampling process, criteria for case identification and timing of the study, may account for some of the differences noted in outcome studies of disaster mental health (20).

In developing countries, disasters represent a significant public health problem. Excluding disasters in the United States, in this century there were 2,392 disasters in the world, but 86.4% occurred in developing nations, producing a total of 42 million deaths and 1.4 billion affected individuals. Seventy eight percent of all deaths occurred in developing countries, where 97.5% of all affected individuals are located. The observed ratio between affected and killed, of only 2.9 for the developed nations, is tenfold greater for developing countries (21). Hence, not only are disasters disproportionately more frequent events in the Third World, but they are also responsible for a much higher proportion of victims who, having survived the impact, need long-term management of their biopsychosocial needs. Moreover, this situation is likely to prove worse, as the fast rise in the populations of some

cities, the pressure on the land and the steadily deteriorating economic conditions of developing nations have forced the underprivileged population into more hazardous areas, thus rendering them more prone to be disaster victims (22).

In developing countries, the delivery of mental health services is best achieved through the appropriate utilization of the primary health care worker (23) who usually is a person with limited education and training, selected by the local community, or with the community's agreement, to perform basic health actions (24). Not only does the scarcity of mental health resources prevent that specialty care be delivered to the large number of patients who have emotional disorders (25), but it is actually felt that, by integrating the biological, psychological and social aspects of the patients' health problems, and by being able to utilize the available community resources more effectively, the primary care worker is in the best postion to deliver more effective comprehensive helath care to larger numbers of patients (26). Various studies have shown that the primary care worker can be trained in these specific mental health tasks (27). In the aftermath of a disaster, it is expected that similar training results can be accomplished, but it has been difficult to establish the appropriate priority for mental health care delivery at the primary level of care. Given the competing general health delivery needs, the psychological consequences of disasters in developing countries have been the subject of few studies, although preliminary observations (28) and empirical evidence (29,30) indicate that they may be significant and in need of greater attention. Therefore it needs to be established clearly that the frequency, severity and types of mental health problems of victims in the community are significant, not only in the immediate aftermath of the tragedy, but also in the medium- and long-term range.

This initial report describes the mental health consequences of a total disaster in a developing country. It attempts to assess the prevalence rate of emotional disorders among victims located in tents and shelters in the disaster area. It also attempts to identify specific personal or environmental factors associated with an increased risk for developing emotional disorders so that early identification of vulnerable victims can be made for the implementation of effective mental health interventions. Subsequent reports will address the frequency of mental health problems seen in primary care clinics in the disaster area, and the primary care worker's capability to correctly identify persons who present emotional difficulties. The ultimate goal of the project is to develop and evaluate a focussed training program in disaster mental health for the primary care worker, concentrating on the more frequent and more significant psychosocial problems of victims, and increasing the efficiency and responsiveness of the health care system to the varied health and mental health needs of disaster victims.

Methods

Seven months after a volcanic eruption which destroyed the small town of Armero, in Colombia (31), an assesssment of the emotional and psychiatric problems of the survivors was carried out to ascertain the prevalence of these conditions and the relevant variables associated with their development.

Two hundred survivors over age 18 constituted the sample for the present study, drawn from two shelters and two camps of the disaster area. The screening was done by mental health professionals local to the disaster and included two psychologists, a psychiatric nurse, and a psychiatric occupational therapist.

The interviews were conducted in the shelters and camps during a 2 month period. Victims were approached by the interviewer and invited to participate in the study. No subject refused to be interviewed. Actually, they seemed to welcome the opportunity to go over the traumatic experience and to ventilate their feelings, often times extending the interview over the anticipated period of 30 minutes.

We were not able to collect data on a control group. The difficulties present in carrying out a disaster study in a developing country are formidable, and focussing the health care workers' efforts in collecting research data already distracts them from pressing service delivery issues. The population in surrounding communities, although not directly affected by the volcanic eruption, had become so involved with the disaster that they could not be seen as a control group. To screen a community sample

in a geographically different area was simply not feasible.

Data were collected on the victims' socio-demographic characteristics, their disaster experience, the emergency shelter environment and social supports available, and their reported physical and emotional complaints. An extensive screening questionnaire was prepared to include a number of questions covering the above areas. It also included a modified version of the Self-Reporting Questionnaire (SRQ) which has been used in several studies to identify individuals with emotional problems (32-34). Similar to other screening instruments for emotional problems, the SRQ indicates that an individual who scores positively is likely to be a "case", although the specific nature of the disturbance cannot be determined. Drawing from our experience in utilizing the SRQ in a developing country (35), questions regarding epilepsy and alcohol abuse were added to the questions on neurotic and psychotic symptoms, as they represent significant problems for primary mental health care. Victims were identified by the SRQ as suffering from emotional distress if they had a positive score of eight or more on the 20-item neurotic subscale, or a score of one or more on the 4-item psychotic subscale, or a score of one on either the question on epilepsy or alcoholism.

Based on their scores on the SRQ, the total sample of 200 individuals was divided into two groups: those who scored positively as per the criteria given above and those who scored negatively. The data regarding their socio-demographic characteristics, their experience of the disaster, their emergency shelter environment and their reported physical and emotional problems were then compared for those two groups to identify significant associations with the level of emotional distress as measured by the SRQ. Significance of any such noted differences was tested by the χ^2 test with Yates correction when appropriate.

Results

The findings of the analysis are given in Tables 1 through 3. As can be seen in Table 1, a little over half of the sample were males, with 70% being under age 45. Fifty seven percent were either legally married or had a common-law marriage; one fifth were single. Half of the sample had elementary education, but one third were illiterate. All except two subjects either were employed or were housewives or students. All subjects were of a mixed racial composition.

The overall prevalence of emotional and psychiatric problems was 56%. As seen in Table 2, the most frequently reported symptoms in the neurotic subscale were feeling nervous, tense or worried, being easily frightened and having headaches. However, the acknowledgement of the presence of any of the twenty symptoms in the neurotic subscale of the SRQ was significantly associated with a positive SRQ score. The strongest predictors of SRQ positivity were the symptoms of feeling unable to play a useful part in life, feeling tired all the time, and having problems in thinking clearly. The most frequent psychotic symptoms were thoughts that someone was trying to harm him/her in some way or hearing voices without knowing where they came from or which other people could not hear.

Table 1

Demographic distribution of victims (n = 200)

	n	%
Sex		
Male	105	52
Female	95	48
Age		
18-44	140	70
45-64	43	22
65 +	27	8
Mean	37.6 ± 16.3	
Marital status		
Single	43	22
Married	25	12
Common-law	90	45
Separated	15	8
Widowed	27	14
Education		
None	61	30
1 - 5	109	54
6 +	30	15
Occupation		
None	2	1
Housewife	65	32
Unskilled worker	58	29
Skilled worker	22	11
Other	53	26

Table 2

Distribution of neurotic symptoms of the SRQ by results of the SRQ

		SRQ	
	Total	Negative %	Positive %
Do you often have headaches?	112	31	69
Is your appetite poor?	85	24	76
Do you sleep badly?	84	30	70
Are you easily frightened?	117	33	67
Do your hands shake?	72	15	85
Do you feel nervous, tense or worried?	163	37	63
Is your digestion poor?	43	19	81
Do you have trouble thinking clearly?	34	9	91
Do you fell unhappy?	68	24	84
Do you cry more than usual?	45	18	83
Do you fiind it difficult to enjoy your daily activities?	73	11	89
Do you find it difficult to make decisions?	68	24	76
Is your daily work suffering?	63	13	87
Are you unable to play a useful part in life?	31	–	100
Have you lost interest in things?	70	17	83
Do you feel that you are a worthless person?	44	14	86
Has the thought of ending your life been in your mind?	34	15	85
Do you feel tired all the time?	42	5	95
Do you have uncomfortable feelings in your stomach?	47	13	87
Are you easily tired?	93	19	81

All comparisons $P<0.001$.

The presence of emotional distress as indicated by the results of the SRQ was examined in relation to selected personal variables, the disaster experience, environmental variables, and reported physical and emotional problems (Table 3). Among the personal variables, only living alone was significantly associated with emotional problems. A consistent trend of increasing age and lower education with a positive SRQ score was noted with a borderline statistical significance.

Various aspects of the disaster experience that could be thought as being closely related to the victims' mental health were not significantly associated with increased emotional distress. For instance, seeing horrible things in the disaster, losing any family members, being unaware of the impending danger, not having made contingency plans for self-protection, having been injured or not having recovered, and not having been of help to others were not predictive of subsequent emotional problems.

Various current experiences were significantly associated with emotional distress. These include having lost a previous job, not feeling that someone was being of help, not knowing a date for leaving

Table 3

Variables associated with SRQ scores

	Self-reporting questionnaire		
	Negative	Positive	*P*
Personal variables	%	%	
Age			
18-44	49	51	
45-64	37	63	NS
65 +	29	71	
Education			
None	38	62	
1-5	45	55	NS
6 +	57	43	
Living alone	17	83	<.02
Disaster experience			
Seen horrible things	45	55	NS
Losing any family member	44	56	NS
Unaware of impending danger	42	58	NS
Not having contingency plans	45	55	NS
Having been injured	37	63	NS
Not having recovered from injuries	24	76	NS
Not having been of help to others	46	54	NS
Environmental variables			
Having lost previous job	25	75	<.003
Not being helped now	33	67	<004
Not knowing date for leaving	37	63	<.02
Dissatisfied with living arrangements	40	60	<.01
Reported physical problems			
Epigastric pain	8	92	<.006
Non-specific symptoms	28	72	<.05
Number of physical complaints			
None	55	45	
1	40	60	
2	40	60	<.02
3	14	86	
Reported emotional problems			
Depression	38	62	<.02
Psychosomatic problems	–	100	<.002
Interpersonal problems	30	70	<.03

the temporary housing and being dissastisfied with living arrangements. Certain reported physical problems were significantly related to a positive SRQ score, particularly complaints of epigastric pain, non-specific symptoms and increasing number of physical complaints. Patients who complained of emotional distress, such as depression, psychosomatic problems or interpersonal difficulties, were also significantly more likely to score positively on the SRQ.

Discussion

The interpretation of these findings is limited by the characteristics of the sample and the instrument used. The sample screened is not representative of all the survivors, as the research subjects are drawn from the lower socio-economic stratum. Having no other resources for alternative housing, they were forced to remain in the shelters of the disaster area. However, this population is the main target for the delivery of primary mental health care in routine clinical settings in developing countries.

A positive SRQ score indicates a probable "psychiatric case", the validating case-identification resting on a psychiatric interview. However, the SRQ has been used as a screening instrument for emotional problems in various clinical settings and community-based studies with adequate sensitivity and specificity (34). The validity of the SRQ for this population is further supported by the fact that victims who complained of having emotional, psychosomatic or interpersonal problems were significantly more likely to have a positive score.

It should also be noted that we do not have a control population to see whether the 56% prevalence rate for emotional problems noted in our sample differs from the levels of emotional distress of the general non-affected population. However, the SRQ was used in the WHO Collaborative Study on "Strategies for Extending Mental Helath Care" in developing countries which was carried out in seven centers, including Colombia (36). This study produced prevalence rates of emotional problems in primary health care clinics rather than in communities, but it seems reasonable to assume that emotional disorders will be at least the same, and probably higher, in health facilities when compared to a community sample. The total prevalence rate for emotional problems among the primary care clinic attenders in four developing countries was of 13.9%. In the Colombian center, the observed rate was of 10.8%. Our findings reveal a community-based prevalence rate which is four times the one found in primary health care clinics. These observations lend support to the assumption that this high prevalence of psychiatric disorders is likely to have been precipitated by the disaster either directly or by the difficult socio-economic situation victims had to face in the post-impact period.

The factors identified as being associated with the development of mental health problems have important consequences for the early identification of individuals at risk for emotional disorders. The primary care worker could easily learn to identify an individual at higher risk by screening such factors. The primary care worker can also be trained through a brief and objective course to implement simple mental health interventions for these individuals.

These findings further indicate that certain environmental aspects need to be considered while providing emergency shelter to disaster victims. For example, identifying a specific date for moving from the temporary shelters into permanent housing seems to be an important protective factor. Additionally, the disaster-relief agencies could make special efforts to inform the victims of the various actions being taken to help them.

It is of interest to note that events that one may intuitively and naturally expect to be associated with emotional distress, such as death of a family member, failed to be significantly associated with a positive SRQ score. One may conjecture at this point that in a disaster of such a magnitude the total loss experienced by many of the survivors blurs the capacity to discriminate emotionally among individual losses, the response being to the total loss, irrespective of its individuals components.

It should also be noted that these data were collected 7 months after the tragedy. Hence, transient emotional reactions seen in the aftermath of the catastrophe were not identified, and we were probably dealing with more severe delayed or chronic froms of psychopathology. It is also possible that some of the emotional problems seen may have been produced not by the disaster itself, but by the continuing difficult living situation, with poor housing, un-

employment and disrupted family and social support systems. Nonetheless, particularly in developing countries, this situation is more often the rule, rather than an exception, in the medium and long-term management of disaster victims, and it can be seen as an integral component of the disaster, extending its impact over time.

Conclusions

Our findings indicate that a disaster of such a magnitude in a developing country is likely to produce very high levels of emotional distress, essentially affecting every other adult victim. These problems moreover are present as late as half a year after the impact, and our clinical observations lend no support to the expectation that this situation may improve. Therefore, it can be stated with certainty that, for the underprivileged population in developing countries which becomes victims of a major disaster, a very high level of mental morbidity can be expected which will require adequate management. In developing countries, specialized mental health resources are already inadequate for the management of emotional problems in routine clinical settings, and in a disaster situation, when the mental morbidity may increase manyfold, they will become totally insufficient. Hence, the mental health actions of the primary care worker in developing countries need to be further explored as an adequate alternative for meeting these important needs.

The SRQ seems to be a simple instrument that can be used for the detection of probable cases of emotional disorders among disaster victims. The identification of certain characteristics of victims that are significantly related to their being emotionally distressed can provide an invaluable guideline to increase the primary care workers' capability for detecting emotional problems in the community or among clinic attenders. Additional studies are necessary to further validate the instrument in assessing disaster victims, to identify the specific emotional disorders seen among disaster victims, to develop educational strategies for training the primary care worker to carry out well-defined mental health tasks, and to evaluate the effectiveness of these interventions.

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