

# Longitudinal Study of Earthquake-Related PTSD in a Randomly Selected Community Sample in North China

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**Objective:** This study longitudinally described rates of posttraumatic stress disorder (PTSD) in two groups with different levels of severity of exposure to an earthquake in North China. The effects of diagnostic criteria on the frequency of detected PTSD were also examined.

**Method:** Subjects were randomly sampled in two villages at different distances from the earthquake epicenter. A total of 181 and 157 subjects were assessed at 3 months and 9 months after the earthquake, respectively, for PTSD by using both DSM-IV and DSM-III-R criteria. The brief version of the World Health Organization Quality of Life Assessment and three subscales of the SCL-90-R were also administered at both assessment points.

**Results:** The village with a higher level of initial exposure to the earthquake and a higher level of postearthquake support had a lower frequency of PTSD than the

village with a lower level of initial exposure and less postearthquake support. The rate of onset of DSM-IV PTSD within 9 months for the two villages was 19.8% and 30.3%, respectively. In both villages, the rate of onset of earthquake-related PTSD within 9 months was 24.2% by using DSM-IV criteria and 41.4% by using DSM-III-R criteria. The introduction in DSM-IV of a criterion requiring clinically significant distress or impairment in functioning for a diagnosis of PTSD was a major contributor to the lower rate of DSM-IV PTSD.

**Conclusions:** PTSD may be as prevalent and persistent in disaster victims in China as in those elsewhere. Prompt and effective postdisaster intervention could mitigate the impact of initial exposure and reduce the probability of PTSD occurrence. Caution should be used in comparing rates of postdisaster PTSD identified by using different diagnostic criteria.

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China has suffered from severe losses caused by many kinds of natural disasters. Natural disasters affect an average of about 200 million people in China and kill several thousand each year. Annual costs for disaster losses exceeding \$12 billion (U.S.) have been reported in the 1990s (1). Globally, people in less developed countries are more likely to be affected by natural disasters, and a greater percentage of people die from natural disasters and industrial accidents in these countries. Of the almost 3 billion people worldwide who were affected by disasters from 1967 to 1991, about 85% lived in Asia (2). However, data on the mental health effects of disaster have predominantly been derived from research conducted in developed countries (3, 4).

In the past decade, posttraumatic stress disorder (PTSD) has been a focus in research on postdisaster psychopathology. PTSD has been found to be the most prevalent type of psychiatric morbidity after disasters (4–7). In one of the first studies investigating PTSD after a natural disaster, Madakasria and O'Brien (8) found a 59% incidence of PTSD among tornado victims. Researchers have suggested that PTSD may be as prevalent among victims of natural disasters as among victims of man-made disasters and other traumatic experiences; however, the reported rates varied widely, ranging from 1.5% in the population af-

ected by Hurricane Andrew (9) to 67% in Armenian earthquake victims (10). Some researchers have investigated postearthquake psychopathology in adults (7, 10–15), but few have addressed the prevalence of earthquake-related PTSD (7, 10).

The disparity in postdisaster PTSD rates has been attributed mainly to methodological differences, including differences in the magnitude of the disasters chosen for study, the time elapsed between the onset of the disaster and data collection, and the methods of sampling and case detection used (16). In addition, there is a notion that somatization of psychological distress or somatic expression of PTSD may be seen more commonly in developing countries (17). More information on PTSD prevalence in various socioeconomic contexts is needed.

It is also important to note that the PTSD rates reported so far have principally been based on DSM-III-R criteria. Since the publication of DSM-IV in 1994, an increasing number of studies have begun to apply the new diagnostic criteria, but little is known about the comparability of rates based on the two sets of criteria. Schwarz and Kowalski (18) investigated the effect of symptom threshold and criteria on the diagnosis of PTSD in adults and children exposed to a man-made disaster. Their results indicated that, within DSM-III, DSM-III-R, and the proposed DSM-

IV criteria, selection of liberal, moderate, and conservative symptom thresholds had robust effects on rates of diagnoses. For example, the number of adults diagnosed with PTSD by using DSM-III-R at liberal thresholds was 13-fold greater than the number diagnosed by using a conservative threshold. However, the final version of DSM-IV is different from that introduced in Schwarz and Kowalski's paper and appears to be stricter in its criteria for PTSD.

The aim of the study reported here was 1) to describe longitudinally the rates of PTSD after an earthquake in a randomly selected rural community sample in North China, 2) to examine preliminarily the relationship between the occurrence of PTSD and disaster exposure as well as other variables, and 3) to investigate the effects of diagnostic criteria on the detected frequency of PTSD.

## Method

### Subjects

At 11:30 a.m. on January 10, 1998, an earthquake measuring 6.2 on the Richter scale shook the Zhangbei-Shangyi district, a rural area in north Hebei province, China. The earthquake affected an area of 2,000 square kilometers, caused 49 deaths and more than 10,000 injuries, and left 44,000 people homeless at a temperature below  $-20^{\circ}\text{C}$ .

Sampling was conducted in two villages: village A, located 10 km away from the epicenter, and village B, located 0.5 km from the epicenter. In village A, 4.4% of the houses collapsed; in village B, 80% of the houses collapsed. There were no deaths related to the earthquake in either village, although deaths did occur in other villages in the region. The two villages were located in a major disaster area; disaster relief authorities assessed village A as having experienced slight damage and village B as having experienced a severe level of destruction. These assessments were associated with a considerable difference between the two villages in the amount of immediate relief and subsequent reconstruction support. Details about the losses and the victims' perceived stress have been described previously (19).

The survey covered all households in the two villages. One respondent within each household was randomly selected on the basis of birth date. Of all persons within the household, aged 18 to 60 years, who had experienced the earthquake in the village and were available to interview, the one whose birthday was the closest forward to the date of the interview was selected as the respondent. As most of the respondents had difficulty understanding written material, written informed consent was not considered to be appropriate for the study. After a complete description of the study to the subjects, oral consent was obtained. No one refused to participate in the investigation. However, the response rate was 91% for village A and 87% for village B because all family members were not available in some households at the time of the interview. A general description of the study group is reported in the first part of the Results section.

### Procedure

The initial assessment took place 3 months after the earthquake. Subjects were given several self-report questionnaires: a disaster experience questionnaire, which also included questions on demographic characteristics, three primary symptom dimensions of the SCL-90-R, and the brief version of the World Health Organization (WHO) Quality of Life Assessment. After completing the questionnaires, a clinical interview for DSM-IV PTSD, described below, was administered. For most subjects, self-report

questionnaires were completed with the assistance of investigators because of the subjects' relatively low education level. Six months later, the subjects were reassessed and again completed the self-report questionnaires, with some modifications. The modifications were that the losses in the earthquake were not rated again and that the subjects were asked to report perceived stress and satisfaction with postdisaster support during the month before the interview.

Although the self-report instruments used in this study have been validated in China, their validity and reliability remains uncertain when an interviewer administers the instruments or assists respondents in completing the instruments. To minimize potential bias, several steps were taken. The disaster questionnaire was developed together with local mental health professionals. All investigators reviewed the entire set of instruments item by item and achieved agreement on how to explain each item to respondents. Items that might be misunderstood were identified, and the best equivalent language in local expression was substituted. The interviewers were asked to use a semistructured format for the interviews, to use the standard explanations agreed on in the preparatory meeting, to read all options listed under each question, and to administer the interview individually.

### Measures

**Demographic data.** Demographic variables included age, gender, years of education, marital status, and health status in the past 2 weeks and in the year before the earthquake.

**Disaster experiences.** Respondents were asked about their perceived level of threat to life during and immediately after the earthquake, the type and amount of losses they experienced, their perceived level of stress, their satisfaction with material and mental health support, and their level of fear of earthquake recurrence. Losses from injury of oneself; deaths of family members, relatives, and friends; damage to one's house; and other property losses were assessed on a 4-point scale. The perceived level of stress associated with deaths of relatives and friends and with the loss of one's house and property and the perceived level of overall stress were evaluated.

**PTSD.** Five psychiatrists, who together reviewed the DSM-IV criteria for PTSD before the investigation, were responsible for the clinical interviews. All of the psychiatrists except one had at least 5 years of experience in general psychiatric practice. The semistructured clinical interview was based on the PTSD module of the Composite International Diagnostic Interview (17). The recording form used the format of the Composite International Diagnostic Interview PTSD module with some modification.

Respondents were asked about the occurrence of any of 17 symptoms for DSM-IV PTSD, including reexperiencing the trauma, avoidance and numbing of general responsiveness, and increased arousal. In addition, for each symptom cluster, the onset, duration, and recency of symptoms were rated. Algorithms for determining the diagnosis were written for DSM-IV and DSM-III-R, respectively. Because the full Composite International Diagnostic Interview was not administered, other diagnoses were not assessed and thus exclusion rules were not incorporated in the process of assigning or rejecting the diagnosis.

As suggested by Davidson (5), interviewers were reminded to pay special attention to the qualifying adjectives "persistent," "recurrent," and "distressing," which appear in the DSM-IV criteria.

Resource limitations did not permit us to conduct a formal between-interviewer agreement test. However, all five psychiatrists co-interviewed the first respondent and had 100% agreement in judging whether symptoms were present. The first author then randomly reassessed four subjects and attained between-interviewer agreements between 88% and 100%. The percentage of subjects given a diagnosis of DSM-IV PTSD by each psychiatrist

**TABLE 1. Demographic Characteristics of Subjects Assessed for Posttraumatic Stress Disorder 3 and 9 Months After an Earthquake in China**

Characteristic	3-Month Assessment (N=181)		9-Month Follow-Up (N=157)	
	N	%	N	%
Male	84	46.4	73	46.5
Married	159	87.8	140	89.2
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
Age (years)	39.63	10.96	40.42	10.58
Education (years)	4.15	3.26	4.13	3.23

ranged from 13.3% to 24.4% in the initial investigation and from 16.6% to 34.3% in the follow-up assessment. Over both assessments, the percentage of subjects given a diagnosis by each psychiatrist ranged from 16.6% to 29.4%.

**Severity of posttraumatic stress symptoms.** An evaluation of the severity of PTSD symptoms over the past month was added in the follow-up assessment. Each positive symptom was rated on the following scale: 1 (mild), 2 (moderate), 3 (severe), 4 (considerably severe), or 5 (extremely severe). A total PTSD score was calculated by summing the values for each symptom.

**Psychological distress.** Psychological distress symptoms were assessed by using three scales of the SCL-90-R, Chinese version, which has been validated and widely used in China (20). We used the subscales for depression, anxiety, and somatization, which together had a total of 35 items. For each subject, mean scores were calculated for the three subscales, and an overall psychological distress score was calculated by averaging the scores for all 35 items.

**Quality of life.** Quality of life was assessed by using the brief version of the WHO Quality of Life Assessment (21, 22), which consists of 26 questions from the global version and three national questions that were not included in the analysis of this paper. The WHO group supervised the development of the Chinese version of the instrument and approved the finished version. The instrument reflected a four-domain structure of quality of life, including a physical health domain, a psychological domain, a social relationships domain, and an environment domain. Some questions were transformed to allow all items to be scored so that higher scores reflected better quality of life.

## Results

The characteristics of the entire study group are summarized in Table 1. In village A, 75 respondents were interviewed in the initial assessment and 66 in the follow-up assessment. In village B, 106 respondents were interviewed in the initial assessment and 91 in the follow-up assessment. There were no significant differences between the two groups on any demographic variable at either the initial or the follow-up assessment. At the initial assessment, 34 respondents (45.3%) in village A were male, and 63 (84.0%) were currently married. In village B, 50 respondents (47.2%) were male, and 96 (90.6%) were currently married. The low proportions of male respondents and high proportions of married respondents resulted from the fact that many unmarried young men were away from home as temporary workers when the earthquake occurred. Although all subjects consented to partic-

ipate the study, the follow-up rate was 88.0% (66 of 75 respondents) in village A and 85.8% (91 of 106 respondents) in village B because some young persons left for temporary work elsewhere after the earthquake. There was no significant difference in follow-up rates between the two villages (Pearson  $\chi^2=0.18$ ,  $df=1$ ,  $p=0.67$ ). Subjects who dropped out of the study did not differ from those who completed it on any of the initial psychometric or demographic measures except that they were significantly younger (mean age=34.46 years,  $SD=12.19$ , versus mean=40.43 years,  $SD=10.58$ ; two-tailed  $t=2.27$ ,  $df=179$ ,  $p=0.03$ ).

Table 2 summarizes the proportions of subjects with PTSD in the two villages at the two assessment points and over the follow-up period. A subject was identified as having a current diagnosis if the individual had fully met DSM criteria for PTSD and was still suffering from at least one of the three clusters of PTSD symptoms within 2 weeks before the assessment. A comparison of PTSD rates between subjects from the two villages revealed that village A had higher PTSD rates than village B throughout the study period despite the lower initial exposure of village A to the effects of the earthquake. The difference between villages was evident, although only the difference in the current rate at 3 months reached statistical significance. Both villages showed the same trend of an increasing rate over time, although the difference was more pronounced in village B, where the rate increased from 8.5% to 14.3% between 3 and 9 months after the earthquake.

Overall, the rates of onset of earthquake-related DSM-IV PTSD were 18.8% within 3 months and 24.2% within 9 months (Table 3). A total of 42 individuals were diagnosed with DSM-IV PTSD during the study period, of whom 38 completed the follow-up study.

DSM-IV changed some of the DSM-III-R criteria for PTSD. The principal changes in DSM-IV included 1) addition of a requirement for an emotional response to the traumatic event (supplement of criterion A), 2) transfer of the symptom of physiological hyperactivity from the hyperarousal symptom cluster to the intrusion cluster (transfer from criterion D to criterion B), 3) addition of a requirement that both avoidance and numbing symptoms must be present (extra requirement in criterion C), and 4) the requirement that the disturbance must cause clinically significant distress or impairment in functioning (a severity criterion). Our clinical interviews were based on DSM-IV criteria, but it was possible to make a DSM-III-R diagnosis by using the interview data and applying the DSM-III-R criteria. The rate of PTSD detected by using the two sets of criteria and their agreement as measured by kappa value are shown in Table 3. No subject who qualified for a diagnosis when DSM-IV criteria were used did not also qualify when DSM-III-R criteria were used. Use of DSM-III-R criteria resulted in a much higher frequency of PTSD, giving an onset rate of 41.4% within 9 months. Kappa values for the agreement between DSM-IV and

**TABLE 2. Rate of DSM-IV Posttraumatic Stress Disorder (PTSD) Over 9 Months After an Earthquake in China in Villages Located 10 km and 0.5 km from the Epicenter**

Time Period	Village A (10 km From Epicenter)			Village B (0.5 km From Epicenter)			Analysis	
	Total N	Subjects With PTSD		Total N	Subjects With PTSD		$\chi^2$ (df=1)	p
Any time within 3 months	75	19	25.3	106	15	14.2	3.60	0.06
Any time within 9 months	66	20	30.3	91	18	19.8	2.31	0.12
At 3 months	75	17	22.7	106	9	8.5	7.18	0.007
At 9 months	66	15	22.7	91	13	14.3	1.86	0.17

DSM-III-R diagnoses ranged from 0.60 to 0.85 over the follow-up.

We examined how each modification of DSM-III-R criteria that was introduced in DSM-IV influenced the frequency of diagnosed cases. Data for subjects who completed the follow-up assessment were used for this purpose. The effect of each of the changes mentioned above was analyzed, with all other criteria kept the same as in DSM-IV. As shown in Table 4, if emotional response was not required for a PTSD diagnosis, the rate of PTSD onset among subjects who completed the follow-up increased from 24.2% to 25.5%. If the severity criterion was not required, the rate rose to 35.0%. This result indicated that the severity criterion was the most important contributor to the lower frequency of DSM-IV PTSD, followed by the extra requirement in criterion C, the supplement of criterion A, and the transfer of the physical arousal symptom from criterion D to criterion B.

Given the major role of the severity criterion in the discrepancy between rate of PTSD diagnosed by using DSM-IV and the rate by using DSM-III-R, the implications of this criterion were further investigated. Table 5 presents a comparison of levels of psychological distress and quality of life at 9 months after the earthquake among three groups of subjects: those with current DSM-IV PTSD, those with subclinical PTSD, and those who did not have PTSD. The group with subclinical PTSD consisted of subjects who fulfilled all DSM-IV symptom criteria but failed to meet the severity criterion. Subjects who did not have PTSD had never satisfied either DSM-IV or DSM-III-R criteria for PTSD at any time during the study. With regard to PTSD symptom severity, the group with current DSM-IV PTSD did not differ significantly from the group with subclinical PTSD, and both of those groups had significantly higher symptom severity scores than subjects who did not have PTSD. The results also showed that subjects with current DSM-IV PTSD had significantly higher psychological distress scores and reported poorer quality of life in all measures. The subjects with subclinical PTSD had intermediate scores between those for subjects with DSM-IV PTSD and those who did not have PTSD. However, the differences were not statistically significant.

## Discussion

This study found that the rate of onset of PTSD after an earthquake in China was comparable to postdisaster rates

**TABLE 3. Agreement Between Rates of Posttraumatic Stress Disorder (PTSD) Diagnosed by Using DSM-IV and DSM-III-R Criteria Among Subjects Assessed Over 9 Months After an Earthquake in China**

Time Period	Subjects With DSM-IV PTSD		Subjects With DSM-III-R PTSD		Agreement (kappa) <sup>a</sup>
	N	%	N	%	
Any time within 3 months (N=181)	34	18.8	43	23.8	0.85
Any time within 9 months (N=157)	38	24.2	65	41.4	0.62
At 3 months (N=181)	26	14.4	32	17.7	0.88
At 9 months (N=157)	28	17.8	53	33.8	0.60

<sup>b</sup> All kappa values are significant at the 0.001 level (z test).

**TABLE 4. Agreement Between Rates of DSM-IV Posttraumatic Stress Disorder (PTSD) and Rates of PTSD Diagnosed by Using DSM-III-R and Modified DSM-IV Criteria Among 157 Subjects Assessed Over 9 Months After an Earthquake in China**

Diagnostic Criteria	Subjects With PTSD		Agreement With Rate of DSM-IV PTSD (kappa) <sup>a</sup>
	N	%	
DSM-III-R	65	41.4	0.62
DSM-IV			
Without requirement for emotional response (supplement of criterion A)	40	25.5	0.97
Without requirement for presence of both avoidance and numbing symptoms (extra requirement in criterion C)	43	27.4	0.92
Without transfer of physiological hyperactivity from the hyperarousal symptom cluster to the intrusion cluster (transfer from criterion D to criterion B)	39	24.8	0.98
Without criterion of clinically significant distress or impairment in functioning (severity criterion)	55	35.0	0.74

<sup>a</sup> All kappa values are significant at the 0.001 level (z test).

of PTSD onset reported elsewhere. The 9-month onset rates of 30.3% and 19.8% in the two villages, respectively, fall in the range reported in previous studies (7, 10). This finding supports the idea that PTSD is a common response after exposure to a natural disaster. The findings reported here also suggest that it takes time for some victims to satisfy the full criteria for PTSD after the traumatic exposure.



**TABLE 5. Mean Number of Symptoms of Posttraumatic Stress Disorder (PTSD) and Scores on Measures of Symptom Severity and Quality of Life Among Subjects Assessed 9 Months After an Earthquake in China, by DSM-IV PTSD Status<sup>a</sup>**

Measure	Subjects With Current PTSD (N=28)		Subjects With Subclinical PTSD (N=17) <sup>b</sup>		Subjects Without PTSD (N=92)	
	Mean	SD	Mean	SD	Mean	SD
Current PTSD symptoms						
Number of symptoms	9.39 <sup>c</sup>	3.53	9.35 <sup>c</sup>	1.97	4.05	3.71
Mean severity score for individual symptoms <sup>d</sup>	3.33	0.74	3.07	0.84	3.10	0.79
Mean severity score for all symptoms <sup>d</sup>	32.36 <sup>c</sup>	16.09	29.65 <sup>c</sup>	13.04	13.16	13.99
Quality of life <sup>e</sup>						
Physical domain score	3.08 <sup>c</sup>	0.74	3.39	0.62	3.71	0.81
Psychological domain score	3.00 <sup>c</sup>	0.80	3.04	0.78	3.33	0.63
Social domain score	3.40 <sup>c</sup>	0.72	3.45	0.83	3.82	0.52
Environmental domain score	2.66 <sup>c</sup>	0.45	2.84	0.39	2.99	0.46
Mean total score	3.04 <sup>c</sup>	0.51	3.18	0.55	3.46	0.46
SCL-90-R						
Somatization subscale score	1.52 <sup>c</sup>	0.93	0.91	0.81	0.83	0.89
Anxiety subscale score	1.37 <sup>c</sup>	0.88	1.11	0.89	0.70	0.75
Depression subscale score	1.20 <sup>c</sup>	0.93	1.00	0.94	0.58	0.67
Mean total score	1.36 <sup>c</sup>	0.81	1.10	0.75	0.70	0.70

<sup>a</sup> Subjects who had met PTSD criteria during the study period but did not meet the criteria at 9 months were excluded from the analysis.

<sup>b</sup> Subjects with subclinical PTSD met all DSM-IV PTSD criteria except the requirement that the disturbance cause clinically significant distress or impairment in functioning. All differences between subjects with PTSD and subjects with subclinical PTSD were not statistically significant.

<sup>c</sup> Significantly different from the mean for subjects without PTSD ( $p < 0.05$ , Bonferroni-corrected  $t$  tests,  $df = 118$ ).

<sup>d</sup> Severity of each symptom was rated on a scale from 1 (mild) to 5 (extremely severe). Total severity score was calculated by summing scores for each symptom.

<sup>e</sup> Assessed by using the brief version of the World Health Organization Quality of Life Assessment.

Our most important finding, which contradicted our hypothesis and the results of most previous studies (10, 23, 24), is that the village with lower initial exposure to the effects of the earthquake had a higher PTSD rate. This pattern was evident at 3 months after the earthquake and remained so at 9 months. In interpreting this finding, it is noteworthy that some potentially confounding variables were well controlled in our study. The comparison involved two communities separated by only 10 kilometers, with comparable socioeconomic and demographic characteristics, and we could reasonably assume comparability between two groups in their baseline physical and mental state. Besides the initial level of exposure to the earthquake, the critical difference between the two groups was the extent of immediate relief and subsequent reconstruction support that they received. Subjects in village A returned to their damaged houses shortly after the earthquake. They did not have enough financial resources and manpower to repair or reconstruct their dwellings, and they reported excessive worry about the possibility of aftershocks. In village B, more emergency relief personnel arrived earlier and stayed longer, helping the villagers to deal with various postearthquake adversities. In the immediate aftermath of the earthquake, subjects in village B lived in temporary housing or tents. The government sent a team of workers to assist in reconstruction work, and all households in village B had new houses before the next winter. In addition, more volunteers and representatives of various aid organizations visited village B and became involved in reconstruction. For example, an organization from Hong Kong donated funds for construction of a temporary primary school. Because of these efforts, subjects in village B received more solicitude and more informa-

tion from multiple sources. They also had more opportunities to put their requests forward and to get a desirable response. Although no mental health professionals visited either village before our investigation, subjects in village B reported significantly more satisfaction with both the material assistance they received and the mental support (19). Compared with village B, village A was in a disadvantageous position immediately after the earthquake and over the entire follow-up period. Despite the lower initial exposure of subjects in village A, they continuously experienced higher levels of postearthquake stress as a result of aftershocks and higher levels of fear of recurrence. As discussed in our previous paper (25), we believe that the additive and interactive effects of postearthquake adversities and relatively inadequate social support accounted for the higher occurrence of PTSD in village A.

Many studies have documented the complex relationship between exposure and psychological sequelae in the aftermath of disaster, and a few have reported a weak association or no association between posttraumatic stress reactions and exposure (reviewed in reference 10). However, the study reported here, to our knowledge, is the first to provide direct evidence that disaster victims with lower initial exposure could be at a higher risk for developing PTSD. The findings suggest the need to examine more carefully the relationship between stress and its sequelae. More important, the findings imply that prompt and effective intervention, even if it is not focused on mental health needs, could reduce the probability of PTSD occurrence.

The findings reported here may be generalized only to groups affected by a disaster of similar magnitude. It is postulated that at higher levels of exposure to trauma, as in disasters involving extremely severe destruction or a

great number of deaths, most individuals will develop posttraumatic stress reactions irrespective of premorbid vulnerabilities (10). However, even in disasters where the possibility of primary prevention for PTSD is limited, a lot can be done to prevent the exacerbation and chronicity of postdisaster psychopathology.

A considerable difference was found in the frequency of DSM-III-R PTSD and DSM-IV PTSD. This difference may be attributable mainly to the introduction of a severity criterion in DSM-IV. Before discussing the implications of this finding, two points deserve further consideration: 1) that the interviewers might have applied relatively liberal symptom thresholds, resulting in the rating of too many symptoms as positive; and 2) that the respondents might have underreported the overall severity or impact of their symptoms.

As shown in Table 5, the average ratings for the severity of PTSD symptoms were over 3 in all three groups—those with current PTSD, those with subclinical PTSD, and those without PTSD. This finding indicates that, in general, only the symptoms that bothered subjects severely were identified as present. In addition, the difference found in measures of quality of life and psychological distress among the three groups supported the validity of the interviewers' judgment.

There are several reasons to consider the possibility of underreported severity. In traditional Chinese culture, people are usually reluctant to express psychological distress. If they experience problems in functioning that might be associated with psychological distress, they tend to attribute these problems to physical or external origins. In addition, the disaster victims in this study engaged in simple agriculture, an activity in which the direct or detectable impact of PTSD symptoms on functioning may not have been apparent. However, the measures of quality of life and the SCL-90-R subscale scores do not support underreporting of severity. The subclinical PTSD group reported a quality of life and level of psychological well-being that was better than those of subjects with PTSD but worse than those of subjects without PTSD, although none of these differences reached statistical significance.

Stein et al. (26) suggested that there may be little to distinguish between full and partial PTSD and raised the question of where the dividing lines should be drawn. Our results also suggest a possible continuum of posttraumatic stress reactions, but our findings must be replicated in different populations with different disaster experiences before more definite conclusions can be made. It may be worthwhile to compare people with full versus subsyndromal PTSD on symptom profiles, impact of symptoms on functioning, and likelihood of seeking mental health help.

The substantial disparity in rates of DSM-IV PTSD and DSM-III-R PTSD raises the question of which set of diagnostic criteria is more useful practically as well as theoretically. Given our limited knowledge and the controversial

research findings on the etiology and psychopathology of PTSD, it is advisable to adopt a flexible position in practice by using stricter criteria in academic investigation and relatively liberal criteria in screening and service planning.

In conclusion, the study results showed that 1) PTSD in disaster victims is as prevalent and persistent in China as elsewhere, 2) the risk of developing PTSD in subjects with lower initial exposure to disaster trauma should not be ignored, and 3) remarkably fewer diagnoses of PTSD were made by using DSM-IV criteria than by using DSM-III-R criteria.

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