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Research Article

Psychopathological Characteristics of ICD-10 Diagnosed Subjects with Post Traumatic Stress Disorder One Month Following a Destructive Earthquake

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Abstract

Background: Only few studies accessed the prevalence of post-traumatic stress disorder (PTSD) one month after an earthquake. Our goal was to study the prevalence of PTSD according to ICD-10 criteria one month following an earthquake, and to determine early appearance of psychopathological symptom dimensions for its development.

Materials and methods: One month after an earthquake of 6.1 on the Richter scale, 97 randomly chosen victims were assessed through a specifically designed semi-structured psychiatric interview comprising questionnaires and scales to measure psychopathology, as well as psychosocial and environmental parameters. PTSD was detected using a questionnaire based on the ICD-10 diagnostic criteria.

Results: PTSD was detected in 42.3% of the sample at one month. PTSD diagnosis was negatively associated with the educational level. A positive association was detected with the intensity of fear of dying during the earthquake, symptoms of phobic anxiety, as assessed by the Symptom Check List (SCL-90,) and the subjective estimation of worsening of post-earthquake quality of life. Factor reduction analysis showed that in terms of general psychopathology the most significant factors associated to the early development of PTSD were symptom dimensions of obsessiveness-compulsivity and phobic anxiety, as assessed by the SCL-90.

Conclusions: The prevalence of PTSD according to the ICD-10 criteria one month after a major seismic disaster event was similar to the prevalence reported by other studies using the DSM diagnostic criteria. Cognitive factors and a distinct profile of psychopathology may relate to the development of PTSD during the early phase of a major seismic albeit with few human casualties. These findings may assist the early identification of people at risk of developing PTSD and the planning of early interventions focusing on the management of post-earthquake fear and anxiety reactions.

Keywords

Post-traumatic stress disorder; Natural disaster; Earthquake; Post-traumatic reactions; Psychopathology; SCL-90

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Introduction

Earthquakes are considered to have a high impact on large groups of people, especially in densely populated areas. Emotional distress and post-traumatic stress symptoms, which occur either during the immediate or late post-impact phase in response to various disasters, are very common [1,2]. There are several published studies on the immediate (one week), mid- (six months) and long-term (one year) psychosocial impact of natural disasters has been reported [3-7]. Fewer studies have investigated the short-term effects, i.e., one month after an earthquake [8-10]. These studies have shown the complex relationship between exposure to the event and its psychological repercussion. The most frequently reported psychopathology is post-traumatic stress disorder (PTSD) assessed either by applying the DSM, or the ICD-10 diagnostic criteria. In both diagnostic systems its prevalence varies significantly, ranging from 10% to 87% [11-13].

Several risk factors of developing PTSD have been identified in victims of major disasters. These include: female sex [14-16], low educational level [2], degree of exposure to the disaster [17], post-earthquake support [18], serious property damage [9], lack of social support [19,20], event-related fears about death and losing control [17,21], introversion and neuroticism [22,23], personality traits [24], nervousness and obsessiveness [9], past history of a psychiatric disorder [25,26] and the early manifestation of post-traumatic symptoms, such as re-experiencing of the event, avoidance, emotional numbing, and increased arousal shortly after the catastrophic event [11,27]. Finally, another important issue is the high rate of comorbidity among patients with PTSD. In a large epidemiological study, 87.5% of PTSD sufferers received at least one additional diagnosis and 77.5% fulfilled criteria for two or more additional diagnoses; the most frequently reported disorders are depression, agoraphobia with or without panic disorder, and substance abuse or dependence [28].

Objectives

The objective of the present study was to explore the short-term prevalence of post-earthquake PTSD, according to ICD-10 research diagnostic criteria, and its relationship with various psychopathological characteristics.

Material and Methods

Study design and settings

In June 15, 1995, (03:15) a destructive earthquake with an intensity of 6.1 on the Richter scale, hit the town of Egion (Peloponnese, Greece) located in an area of high seismic activity. A great number of houses were seriously damaged and had to be demolished. Twenty-six people died; most of them were tourists staying in a hotel that collapsed. The majority of the citizens (approximately 20.000) had to relocate in tents for several weeks. One month after the earthquake, a team of psychiatrists visited tent dwellers in order to provide psychological assistance, as well as to investigate the psychological aftermath during the early phase of the post-disaster period.

Participants

The sample comprised 97 randomly selected earthquake victims who were permanent residents of the town and during that the after-

earthquake period lived in five tent blocks. Assessment was carried out by five psychiatrists, one psychologist and one social worker. To ensure representativeness, the percentage of subjects selected from each tent block corresponded proportionally to the number of tents per block and the number of people per tent. Selection of the interviewee in each tent was based on his/her status as the head of household, systematically alternating between men and women. All subjects gave their informed consent.

Assessment

Several sociodemographic variables (age, sex, socio-economic status, years of education, family status, and number of family members) were recorded. Data on the type/extent of any pre-earthquake material or physical damage due to other causes and previous mental and somatic disorders were also collected. The condition of the damaged buildings was evaluated according to the official data obtained from the administration.

Fear of dying during the earthquake was assessed with a self-reported five-point Likert item measuring subjective fear during the event (0=no fear, 1=mild, 2=somewhat severe, 3=severe, 4=extreme). State anxiety at the time of the interview depicted anxiety at the time of (four-point scale: 1=not at all, 2 a bit, 3=moderate, 4=a lot), was measured with the 21-item state subscale of the Spielbergers State - Trait Anxiety Inventory (STAI, Charles D. Spielberger, 1968), standardized for the Greek population [29]. Symptoms of psychopathology during the previous week were evaluated through the Greek version of the Symptom Checklist-90-R (SCL-90-R) [30], a self-report psychometric instrument measuring nine primary symptom dimensions [somatisation, obsessiveness-compulsivity, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, psychoticism), as well as changes in appetite, sleep problems, suicidal ideation and feelings of guilt. The instrument yields three global indices [Global Severity Index (GSI), Positive Symptom Index (PSI) and Positive Symptom Distress Index (PSDI)]. The diagnosis of PTSD was made through a structured questionnaire composed of 10 items based on the ICD-10 diagnostic criteria and provided information about the presence of (1) persistent remembering or reliving of the event in intrusive flashbacks, and/or vivid memories, (2) recurring dreams of the event, (3) experiencing distress when exposed to circumstances resembling or associated to the event, (4) actual or preferred avoidance of circumstances resembling or associated with the event, (4a) if present, was it obvious previous to the traumatic event? (5) inability to recall either partially or completely some important aspect of the period exposed to the event, (6) difficulty falling or staying asleep, (7) irritability or outbursts of anger, (8) difficulty concentrating, (9) hypervigilance, and (10) exaggerated startle response. Further, a modified short 16-item Greek version of the Eysenck Personality Inventory (EPI) was used to assess the personality characteristics of extroversion and neuroticism [31]. Participants also estimated their quality of life before and following the earthquake on a seven-point Likert scale (1= very bad, 2= quite bad, 3= bad, 4= nor good nor bad, 5= good, 6= quite good, 7= excellent).

Data analysis

For numeric variables means ± standard deviation (SD) were calculated; qualitative variables are presented with frequencies. For the comparison of proportions chi-square and Fisher's exact tests were used. Student's t-tests were used to compare mean values of numeric variables between the PTSD and n-PTSD groups. Adjusted odds ratios were computed from the results of the logistic regression analysis. Factor analysis was used to reduce SCL-90 psychopathology dimensions that explain most of the variance in PTSD cases. All statistical inferences are based on two-tailed probabilities. Statistical significance was set at 0.05 level. Data analysis was performed using SPSS statistical software package (version 19.0; SPSS Inc, Chicago Illinois, USA).

Results

Sociodemographic and other characteristics of the sample

Ninety-seven subjects (women: 52.6%, men: 47.4%) with a mean age (± SD) 47.6 ± 15.2 years (range 18-75) and 7.8 ± 3.5 years of education were included in the study. Most participants were married (74.2%); the mean number of family members was (± SD) 4.0 ± 1.6. At the time of the interview 47.4% of the subjects reported to suffer either from a chronic somatic disease (44.3%), or a minor mental reaction (15.5%); 8.2% reported taking psychotropic medication, mostly minor anxiolytics. Moreover, 44.3% of the total sample, had previously experienced a major earthquake and 28.9% had been exposed to another catastrophic event in the past (Table 1).

Living conditions after the earthquake

Severe damages to their house were reported by 78.4% of the interviewees, 47.4% of which had to be demolished (Table 1). 88.7% had to change their housing conditions, 14.4% had change work activities, 48.5% reported a marked worsening of their finances, and the vast majority (81.4%) reported a significant deterioration of their quality of life.

Psychological reactions one month after the earthquake

STAI state anxiety was (± SD) 53.9 ± 12.6 and anxiety was of moderate intensity (2.5 ± 0.6). Global psychopathology, as measured by the SCL-90 GSI was found to be mild (0.54 ± 0.32), whereas the PSDI was estimated to be of moderate severity (1.99 ± 0.41). Finally, early (one month) PTSD according to the ICD-10 criteria was detected in 41 subjects (42.3 %).

Characteristic features of PTSD subjects

Earthquake victims who developed PTSD were less educated (PTSD: 6.68 ± 3.51 vs n-PTSD: 8.64 ± 3.38 p< 0.007) and had fewer members in their nuclear family (PTSD: 3.59 ± 1.26 vs n-PTSD: 4.38 ± 1.76, p<0.016) than victims (n-PTSD) who did not develop PTSD. There were no significant differences between the two groups in terms of age (PTSD: 49.73 ± 14.67 vs n-PTSD: 46.02 ± 15.59, p<0.238), marital status married (PTSD: 31(43.1%) vs n-PTSD: 41(56.9%) p<0.790), occurrence of a chronic somatic disease (PTSD: 16(37.2%) vs n-PTSD: 27(62.8%), p<0.244) or minor mental reaction (PTSD: 5(33.3 %) vs n-PTSD: 10(66.7%), p<0.320), experiencing of a past earthquake (PTSD: 21 (48.8%) vs n-PTSD: 22 (51.2%) p<0.243), or other catastrophic event (PTSD: 13(46.4%) vs n-PTSD: 15(53.6%) p<0.597), the loss of property (PTSD: 3 (33.3%) vs n-PTSD: 6 (66.7%) p<0.729), the loss of house (PTSD: 11(35.5%) vs n-PTSD: 20(64.5%), or any kind of material losses (PTSD: 15(34.1%) vs n-PTSD: 29 (65.9%) p<0.100), and the serious damage of their house (PTSD: 30(39.5%) vs n-PTSD: 46(60.5%) p<0.208). Loss of social milieu was more frequently reported by the n-PTSD group (PTSD: 0(0%) vs n-PTSD: 6(100.0%) p<0.037) (Table 1). Fears of various type experienced during the earthquake are shown in Table 2. The prevalence and intensity of the reported fear of dying during the

Table 1: Sample demographics and other characteristics in total and for the PTSD and N-PTSD group.

	Total N=97 Mean ± SD	PTSD N=41 Mean ± SD	N-PTSD N=56 Mean ± SD	P
Sex, N (%)				
Men	46 (47.4)	15 (32.6)	31 (67.4)	0.067*
Women	51 (52.6)	26 (51.0)	25 (49)	
Age (years)	47.56 ± 15.23	49.73 ± 14.67	46.02 ± 15.59	0.238**
No of family members	4.04 ± 1.61	3.59 ± 1.26	4.38 ± 1.76	0.016**
Years of education	7.81 ± 3.55	6.68 ± 3.51	8.64 ± 3.38	0.007**
Family status, N (%)				
Married	72(74.2)	31(75.6)	41(73.2)	0.790*
Other	25(25.8)	10(24.4)	15(26.8)	
Existence of a Disease in the past (somatic and/or mental), N (%)	49(47.4)	17(41.5)	29 (51.8)	0.315*
Existence of a minor somatic disease	43(44.3)	16(39.0)	27(48.2)	0.244*
Existence of a minor psychiatric reaction	15(15.5)	5(12.2)	10(17.9)	0.320*
Past earthquake experiences, N (%)	43(44.3)	21 (51.2)	22(39.3)	0.243*
Past catastrophic experiences, N (%)	28(28.9)	13 (31.7)	15 (26.8)	0.597*
Loss of property, N (%)	9(9.3)	3 (7.3)	6 (10.7)	0.729***
Loss of house, N (%)	21(21.6)	11 (26.8)	20 (35.7)	0.354*
Loss of social environment, N (%)	6(6.2)	0 (0.0)	6 (10.7)	0.037***
Reporting of losses in general (Total) , N (%)	44(45.4)	15 (36.6)	29 (51.8)	0.100*
Serious damages of the house N (%)	76 (78.4)	30 (73.2)	46 (82.1)	0.208*

i-square test; **Student's t-test; ***Fisher's exact test

Table 2: Reporting fears experienced during the earthquake for the PTSD and N-PTSD group.

	PTSD N=41 Mean ± SD	N-PTSD N=56 Mean ± SD	P
Experienced fear of own death, N (%)	39 (95.1)	39 (69.6)	0.002*
Fear of own death (intensity scale 1-4)	1.59 ± 0.67	1.2 ± 0.96	0.028**
Experience fear of harm done to beloved ones, N (%)	40 (97.6)	49 (87.5)	0.075*
Fear of harm done to beloved ones (Intensity scale 1-4)	1.93 ± 0.52	1.82 ± 0.89	0.481**
Experience fear of property loss, N (%)	4 (9.8)	14 (24.1)	0.068*
Fear of possession loss (intensity scale 1-4)	0.56 ± 0.87	0.75 ± 1.1	0.362**

*chi-square test; **Student's t-test

earthquake was higher in the PTSD than in the n-PTSD group (PTSD: 39(95.1%) vs. n-PTSD: 39(69.6%) p<0.002 and PTSD: 1.59 ± 0.67 vs n-PTSD: 1.2 ± 0.96, p<0.028, respectively). On the other side more n-PTSD subjects reported intense fear to lose their property during the earthquake (PTSD: 4 (9.8%) vs n-PTSD: 14 (25.0%) p<0.048), whereas the overall intensity of the reported fear of possession loss did not differ between them (PTSD: 0.56 ± 0.87 vs n-PTSD: 0.75 ± 1.1 p<0.362). Changes of daily habits, psychosocial problems and the quality of life level, after the earthquake for the two groups are presented in Table 3. Increased coffee consumption and family and social problems were more frequently reported by the PTSD group. Last, individuals who developed PTSD self-reported a significantly reduced quality of life following the earthquake (PTSD: 2.9 ± 0.1 vs. n-PTSD: 3.7 ± 1.2, p<0.001).

Concerning personality traits of neuroticism and extraversion measured with EPI no difference was found between PTSD and n-PTSD groups. PTSD subjects scored higher on the state-anxiety subscale of the STAI (PTSD: 60.51 ± 9.88 vs n-PTSD: 49.21 ± 12.32, p<0.001) as well as on the intensity of the anxiety (PTSD: 2.88 ± 0.47 vs N-PTSD: 2.34 ± 0.59, p<0.001); the former scored also higher on the SCL-90 phobic anxiety symptom dimension (PTSD: 2.65 ± 3.19 vs n-PTSD: 1.44 ± 1.95, p<0.023). Finally, the SCL-90 Positive Symptom Index (PSI) was significantly higher in the PTSD group compared with the n-PTSD group (PTSD: 26.63 ± 10.06 vs n-PTSD: 21.68 ± 11.97, p>0.034) (Table 4).

Multiple logistic regression analysis of the dichotomous dependent variable PTSD/n-PTSD (Table 5) showed that the development of PTSD related positively with the prevalence of the reported fear of dying during the earthquake, the occurrence of increased post-earthquake phobic anxiety symptom dimension, and the perceived worsening of quality of life after the catastrophic event (association with greater odds for having PTSD). Educational years were associated with lower likelihood for PTSD. Last, factor analysis, of the SCL-90 psychopathology symptom dimensions that explain most of the variance in the PTSD cases showed that the most significant factors were the dimensions of obsessiveness-compulsiveness and phobic anxiety symptom dimensions, whereas in the N-PTSD cases the most significant factors were the somatization and the obsessiveness-compulsiveness symptom dimensions (Table 6).

Discussion

The present study investigated the prevalence of early PTSD, one month following an earthquake, based on the ICD-10 research diagnostic criteria. The prevalence of PTSD was found to be 42.3%, which falls within 42-63% range of previous epidemiological studies applying either the ICD-10 or the DSM-IV-TR criteria, one month

Table 3: Change of daily habits, psychosocial problems and reported quality of life level after the earthquake in PTSD and N-PTSD subjects

	PTSD (N=41) N(%)	N-PTSD (N=56) N(%)	P Chi-square test
Change of habits			
Smocking	18 (43.9)	20 (35.7)	0.414
Coffee consumption	14 (34.1)	7 (12.1)	0.011
Alcohol consumption	5 (12.2)	7 (12.5)	0.964
Use of medicaments	3 (7.3)	1 (1.8)	0.308*
Eating	26 (63.4)	26 (46.4)	0.097
Sex desire	11 (26.8)	17 (30.4)	0.705
Sex activity	11 (26.8)	19 (33.9)	0.455
Change of problems			
Family problems	18 (43.9)	20 (35.7)	0.414
Social problems	14 (34.1)	7 (12.1)	0.011
Work problems	5 (12.2)	7 (12.5)	0.964
Housing problems	3 (7.3)	1 (1.8)	0.308*
Financial problems	26 (63.4)	26 (46.4)	0.097
***Quality of life level after the earthquale,* mean ± SD**	2.9 ± 0.1	3.7 ± 1.2	0.001**

*Fisher's exact test;** Student's t-test

Table 4: Mean Scores of the EPI, STAI and SCL-90 dimensions for the PTSD and N-PTSD group.

	PTSD Mean ± SD	N-PTSD Mean ± SD	P Student's t-test
Eysenck Personality Inventory			
Neurotisism	3.92 ± 2.63	3.36 ± 2.61	0.303
Extraversion	4.47 ± 1.61	4.54 ± 1.25	0.836
Spielberger STAI Q present anxiety			
Anxiety level (21-84)	60.51 ± 9.88	49.21 ± 12.32	<0.001
Intensity of Anxiety (scale 1-4)	2.88 ± 0.47	2.34 ± 0.59	<0.001
SCL-90			
Somatization	3.34 ± 2.71	3.66 ± 5.43	0.73
Obsessive Compulsivity	7.27 ± 4.96	6.63 ± 5.41	0.551
Interpersonal Sensitivity	5.02 ± 3.11	4.95 ± 3.73	0.914
Depression	11.88 ± 7.32	9.71 ± 7.77	0.169
Anxiety	5.80 ± 3.67	4.66 ± 4.33	0.174
Anger/aggressiveness	2.95 ± 2.41	3.46 ± 3.49	0.42
Phobic anxiety	2.65 ± 3.19	1.44 ± 1.95	0.023
Paranoid ideation	6.43 ± 2.82	5.89 ± 3.95	0.452
Psychotism	2.41 ± 1.69	1.78 ± 1.64	0.068
Total SCL-90	51.95 ± 24.71	46.43 ± 30.85	0.347
Positive Symptom Distress Index (0-4)	1.94 ± 0.42	2.03 ± 0.41	0.293
Positive Symptom Index (1-90)	26.63 ± 10.06	21.68 ± 11.97	0.034
Sleep problems	2.78 ± 2.18	2.73 ± 3.01	0.931
Appetite problems	1.96 ± 1.79	1.80 ± 1.98	0.706
Suicidal ideation	0.41 ± 0.86	0.57 ± 1.09	0.444

after the catastrophic event [32,33]. This variability is probably due to the great differences in casualties and material losses caused by earthquakes. Our study comprised individuals afflicted solely by material damages and therefore the recorded PTSD reactions were not grief-related (personal or social); the few human casualties were mostly tourists, staying in a hotel that collapsed.

In terms of the acknowledged sociodemographic risk factors for the development of PTSD following a seismic event, female sex has been often to be of significance [14,15]. However, in our sample, women exposed to a catastrophic event with few casualties, were not more vulnerable to PTSD than men, suggesting that reactions to bereavement per se may be important for the development of PTSD and may differ between sexes under different circumstances [34-37].

Corroborating previous findings, individuals who developed PTSD were found to be of a lower level of education [2,38], which suggests that a cognitive and/or sociocultural factor may be implicated in the development of the disorder.

There is evidence that stress responses following a natural disaster correlate with the intensity of fear of dying during the event [25,26]; some studies have shown that fear of dying during a natural disaster is an important risk factor for the persistence of acute stress reactions [4] and PTSD [39].

Our finding, that fear of imminent death during the earthquake was a strong PTSD predictor is an indication that personality traits and personal cognitions play a role in the perceived fear of death or serious injury, and may predispose a person to PTSD. Whether such a predisposition relates to structural and/or functional changes in the brain structures involved in fear conditioning, i.e., the amygdala

Table 5: Results from multiple logistic regression analysis with PTSD as the dependent dichotomous variable (yes/no).

	B	S.E	95%CI	P
Sex (reference= Female)	-1.06	0.67	0.424	0.16
Age (years)	0	0.03	1	0.837
Education (years)	-0.25	0.11	0.76	0.01
Total number of family members	-0.24	0.19	0.86	0.431
Existence of any disease (somatic and/or psychic	-1.1	0.6	0.42	0.146
Phobic Anxiety Symptoms (SCL-90)	0.28	0.14	1.38	0.05
Post earthquake change of housing conditions	1.98	1.51	12.79	0.125
Post earthquake change of financial problems	-1.26	0.71	0.17	0.066
Previous earthquake experience	0.63	0.64	1.48	0.57
Previous experience of catastrophic events (any)	0.41	0.64	1.36	0.625
Neuroticism (16-item EPI)	-0.14	0.17	0.97	0.869
Extraversion (16-item EPI)	0.09	0.29	1.28	0.387
Fear of dying during the earthquake	0.92	0.45	2.4	0.04
Fear of harm to relatives during the earthquake	-0.1	0.5	0.83	0.727
Total number of material losses	-0.77	0.36	0.49	0.064
Perceiver reduction of life quality level	0.61	0.28	5.48	0.04

*Odds Ratio

Table 6: Factor reduction of SCL-90-R clusters as principal components through Varimax with Kaiser Normalization rotation of PTSD cases =1 and n-PTSD cases =0 (no PTSD one month after the earthquake).

Variables (SCL-90-R clusters)	PTSD subjects	n-PTSD subjects
	Component 1	Component 1
	Significance 0.792	Significance 0.745
Somatisation	0.69	0.8
Obsessive Compulsive symptoms	0.92	0.81
Interpersonal sensitivity	0.55	0.44
Depression	0.61	0.7
Anxiety	0.6	0.6
Hostility	0.23	0.07
Phobic Anxiety	0.89	0.66
Paranoid Ideation	-0.08	0.04
Psychoticism	0.58	0.42
Symptoms of Sleep disturbances	-0.11	0.72
Symptoms of eating	0.54	0.71
Suicidal thoughts	-0.1	0.15

and the hippocampus, as evidence suggests [40,41], needs to be investigated. Moreover, this finding highlights the importance of addressing such existential issues when treating people with an extreme fear of dying. We may also argue that subjects who did not show PTSD psychopathology may have improved cognitive mechanisms of coping with intense fear. Their higher educational level in relation to the fact that they reported less fear of dying during the earthquake supports our hypothesis.

In our study, major predictive factors of PTSD were high anxiety levels, compulsive symptoms and symptoms of phobic anxiety. This is in agreement with the high prevalence of panic disorder, social phobia and specific phobias, among other mental disorders that has been reported in the literature [42,43]. This frequent comorbidity can be attributed to common underlying pathophysiological mechanisms in PTSD symptoms and phobic anxiety; amygdala hyperactivation in PTSD, social anxiety disorder and specific phobias indicates the over involvement of the fear circuitry in these disorders [44]. Regarding compulsivity, either comorbid or as trait characteristic, it can be partly explained by the symptoms shared by PTSD and obsessive-compulsive disorder. Thus, according to Solomon and colleagues [45]. this phenomenon occurs because both disorders are characterized by intrusive thoughts and ritualistic behaviours to ensure security.

As some studies suggest [46,47], the relationship between these two conditions may be additionally accounted for by comorbid depression, a finding that is not corroborated by the present study.

Finally, our study aimed to provide data about screening for victims who show psychopathological reactions, so that early interventions could be applied more precisely, by using a single screening instrument, like the SCL90-R.

Limitations

The major limitations of the present study are: a) the relative small, albeit representative, sample size, b) the retrospective assessment of feelings and reactions (e.g. perceived fear of dying during the earthquake) during the catastrophic event, and c) the use of a seven-point Likert scale for estimating quality of life, instead of a standardized one.

Conclusion

The prevalence of PTSD according to the ICD-10 criteria one month after a catastrophic earthquake was similar to the prevalence reported by other studies using the DSM diagnostic criteria. Intense fear of dying during the seismic event, as well as psychopathological symptoms of obsessiveness-compulsivity and phobic anxiety, as

detected by the SCL-90, may contribute to the development of PTSD during the early phase of a natural disaster. PTSD and other anxiety syndromes can develop shortly after an earthquake, seemingly because of common underlying pathophysiological mechanisms and common clinical manifestations. Identification of such symptoms during the early aftermath period, which increase the risk of developing PTSD, should prompt interventions focusing on the management of fear and anxiety.

Declaration of Interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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