

Prevalence of Psychopathology and Sociodemographic Characteristics among Earthquake Survivors in Eastern Azerbaijan, Iran.

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Article info:

Received: 13 Jun. 2015

Accepted: 23 Aug. 2015

Keywords:

Psychopathology,
Sociodemographic,
Earthquake, East Azerbaijan,
Iran

ABSTRACT

Background: This study aimed to prospectively analyze the effect of a major earthquake on the prevalence of psychological disorders such as acute stress disorder (ASD), anxiety, depression, mixed anxiety depression disorder (MADD), phobia, aggressive behavior, insomnia, psychosomatic disorders and also sociodemographic aspects among residents of rural community sample in East Azerbaijan, Iran.

Materials and Methods: The sample was composed of 801 adults exposed to the earthquake. Two months after the earthquake, all subjects were surveyed with measures administrated in a standard order as follows: demographic data sheet, disaster experiences scale (DES), general health questionnaire (GHQ), and symptom checklist 90-revised (SCL-90-R).

Results: The results revealed that 23% of the survivors in the exposed group had ASD, 10% had anxiety symptoms, 7.5% depression, 4% MADD, 5% psychosomatic disorders, 10% phobia, 7% aggressive behavior, and 10% insomnia.

Conclusion: This article has summarized the current status of information on mental disorders caused by experiencing or witnessing a life threatening severe earthquake. The experience of fear, helplessness, and panic during the earthquake, and the appraisal by the victims of serious psychological, social, as well as demographical consequences after the earthquake, were positively related to the subscale scores and the total score of GHQ, SCL-90-R, and DES.

1. Introduction

The 2012 East Azerbaijan earthquakes occurred near the cities of Ahar, Heris, and Varzaqan in Iran's Eastern Azerbaijan Province, on August 11, 2012, at around 16:53 Iran Standard Time. The two quakes measured 6.4 and 6.3 on the moment magnitude scale and were separated by 11 minutes. The epicenter of the earthquakes was 60 km from Tabriz city. At least 306 people died and more than 3000 were injured, primarily in the rural and mountainous areas to the northeast of Tabriz. The worst damage and most casualties were in villages near the towns of Varzaqan and Heris.

Iran is situated in one of the most disaster-prone regions of the world. For example, Bam (2003) was hit by the worst earthquake of the country in more than a decade. According to the latest estimates, about 30000 people were killed, approximately 30000 injured (of whom about 10000 were sent to other cities), and around 45000 people were made homeless in Bam City (this figure might increase to 75000 if we consider those people who returned to the area, the injured people released from hospitals outside the area, and the return of an anticipated 10000 who have sought refuge with relatives in neighboring villages and districts).

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Although natural disasters differ widely, they usually have some common characteristics in terms of the risks of survivors' developing psychopathology and mental distress. Life threat, injury to oneself or family member, death of loved ones, and property loss were among the risk factors which have been identified [1, 2]. All of these factors exist typically in any natural disaster. The consequences of these disorders can be long lasting. In addition, a different kind of disaster may have a different impact on mental health [1] and it [3] is important to distinguish continuing situations (e.g. ongoing war, ongoing drought) from acute ones, because chronic disasters result in simultaneous acute and ongoing disaster-related problems. However, the impact of traumatic distress on the mental health of survivors in rural community sample in Azerbaijan is less studied.

In the aftermath of a disaster, people may experience not only physical disorders but also acute stress disorder (ASD), which can persist for up to 4 weeks. Furthermore, chronic post-traumatic stress disorder (PTSD) is common among individuals who have faced such situations [4]. Studies of disaster-related mental disorders typically include assessment of the prevalence of PTSD, follow-up of patients diagnosed with ASD [5], and a comparison of the numbers of new and previous cases of PTSD in a given area. However, because these studies are usually planned after a disaster, pre-disaster prevalence must be determined retrospectively. A recollection of previous insomnia is likely to be less accurate than the prospective reporting of current symptoms of insomnia, especially during the traumatic aftermath of a disaster.

Here, the present study investigated the psychosocial and demographic aspects of the earthquake two months after it in a selected community population subsample in the rural region of East Azerbaijan, Iran. In particular, the study aimed to (a) assess the differences in the prevalence of psychopathology 2 months after the earthquake, and (b) examine sociodemographic and disaster related losses variables predictive of psychiatric caseness.

2. Materials and Methods

According to the available census, the population of Ahar, Heris, and Varzaqan (residents, excluding aid workers) was about 149000 people (Ahar 67000, Heris 40000, and Varzaqan 42000) before the earthquake. The Crisis Intervention Committee (CIC) divided Azerbaijan after the earthquake into 3 separate zones for management of mental health service delivery. One zone

was selected randomly for sample collection (zone number 2–A, Heris). Only 1 person from each tent or house was selected for the interview. The person whose his or her age was above 20 years was requested to take part in the interview. A total of 863 interviews (from 8 villages) were carried out with this procedure. Final data from 801 participants were entered into the analyses (62 were dropped from analysis due to incomplete or unreliable data, according to the clinical judgment of the interviewers). Among 801 subjects, there were 285 male (35.6%) and 516 female members (64.4%). All participants were examined in their tent or place of temporary residence. An expert clinical psychologist or counselor carried out the interviews on a one-on-one basis and filled in the questionnaires after establishing therapeutic neutral rapport.

Measures

General Health Questionnaire (GHQ)

A Persian version of the general health questionnaire (GHQ-28) [6] was administered, which was prepared by Mosavi (1998) [7] in London for the Iranian and Afghan populations. The validity and reliability of the Persian GHQ-28 was documented in several Iranian publications, including Noorbala, Mohammad, Bagheri-Yazdi, and Yasami (2002) [8] in a nationwide study. A Likert-type scoring (0–3) was used for the present study; scores ranged from 0 to 21 for the subscales (physical health, anxiety, social functioning, and depression) and from 0–84 for the total score (see also, [9]).

Symptom Checklist 90-Revised (SCL-90-R)

A Persian validated version of SCL-90-R was used [10]. It is a 90-item self-report system inventory developed in the 1980s by Derogatis (1994) [11] and designed to reflect the psychological symptom patterns of community, medical, and psychiatric respondents. The SCL 90-R is a simple questionnaire, translated into official language of Iran (Persian), understandable to almost every Iranian, and its validity and reliability were approved in an independent study. Each item in SCL-90-R is rated on a 5-point scale of distress (0-4) ranging from “not at all” to “extremely”. The 9 primary symptom dimensions are labeled as: somatization (SOM); obsessive-compulsive (O-C); interpersonal sensitivity (I-S); depression (DEP), anxiety (ANX); hostility (HOS); phobic anxiety (PHOB); paranoid ideation (PAR); and psychoticism (PSY). The test was completed by respondents in about 10-15 minutes. According to SCL-90-R, a caseness is when a respondent has a GSI score greater

or equal to a T score of 63 or if any of two dimension scores are greater than or equal to a T score of 63.

Disaster Experiences Scale (DES)

Included here were perceived threats to life during and immediately after the earthquake; losses; perceived stress; satisfaction with support; and fear of another earthquake (seismophobia). The losses were assessed in terms of injury to oneself, death of family members, relatives and friends, damage to one's house, and other property loss except for one's house. Perceived stress was evaluated in terms of 3 factors; death of relatives and friends, house and property loss, and overall stress.

Demographic data sheet

The demographic questionnaire measures features such as gender, age, years of formal education, the duration of time being in Azerbaijan, the level of earlier experiences for rescue operations, and the history of previous physical, or psychiatric disorders.

Procedure

The participants completed the above scales in one session about 60 days (range 10 to 70 days) after the earthquake. Measures were administrated in a standard order as follows: demographic data sheet, disaster experiences scale (DES), general health questionnaire (GHQ) and symptom checklist 90-revised (SCL-90-R).

Ethics

Table 1. Demographic characteristics of the sample.

Variables	Classification	Number (Total=801)	%
Age group, Y	20-30	198	24.7
	31-40	210	26.3
	41-50	191	23.9
	51-60	118	14.7
	61-70	84	10.4
Education	Illiterate	162	20.3
	Primary school	390	48.7
	Secondary School	217	27.1
	Collage/University	32	3.9
Marital status	Married	512	63.9
	Single	173	21.6
	Divorced	18	2.2
	Widowed	98	12.3
Occupation	Professional occupation	17	2.1
	Sales and customer service occupation	94	11.7
	Elementary occupation	690	86.2

The study has been approved by CIC of Iranian psychological association and informed consent was obtained from each participant.

3. Results

This information was used to research plan when an earthquake struck Ahar, Heris and Varzaqan in 2012. When the earthquake struck East Azerbaijan, the CIC of Iranian psychological association was able to quickly build on the training undertaken in the previous year and soon trained more than 100 mental health professionals to deliver the adapted 4 sessions from the crisis intervention manual.

In this research, a total of 801 subjects took part in 8 villages, of whom 516 (64.4%) were males. The demographic characteristics are presented in Table 1. Each major group of occupations are further organized into sub-major, minor and unit (not shown) groups. The basic criteria used to define the system were the skill level and specialization required to competently perform the tasks and duties of the occupations. In this study, the professional occupations involved engineering professionals, health professionals, and teaching professionals.

All subjects had witnessed the earthquake; 23.2% (n=186) had been entrapped; 30.0% (n=241) had suffered physical injuries; and 5.6% (n=45) had permanent physical disability. Sixty-nine subjects (8.6%) had lost at least one first-degree relative in the catastrophe.

Table 2. Basic characteristics of 20 villages surveyed.

Research Zone "A"				Research Zone "B"			
Villages	Population	Casualties	Damages	Villages	Population	Casualties	Damages
Jigha	1416	6 fatalities	100%	Someah	459	2 fatalities	90%
Shahsavari	520	2 fatalities	100%	Khalaj	680		60%
Aghalilo	1145	4 fatalities	100%	Meynagh	212	----	60%
Ghizghapan	150	1 fatality	100%	Saray	345	3 fatalities	40%
Goydaragh	165	2 fatalities	100%	Maghsodlo	318	----	90%
Valilo	1340	2 fatalities	100%	Bilverdi	1520	----	30%
Bajbaj	326	29 fatalities	100%	Asbkhan	511	2 fatalities	50%
Chobanlar	360	1 fatality	90%	Bazvan	320	1 fatality	30%
Khormalo	645	----	60%	Sarand	388	1 fatality	60%

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In the first two months after the earthquake, some 1800 adults as well as children in 18 villages received the psychosocial intervention based on our findings in this study. Statistics CIC has made data available on the enrolment of people after the East Azerbaijan earthquake. Totally, 7 psychological teams have been sent to the affected region, along with 3 ambulances, 1 medical bus and 2 cars. Eleven villages were 30%-90% destroyed, and 7 were completely leveled. At least 62 people died (Table 2) and more than 1037 were injured in our research zone.

The medical infrastructure in the catastrophe stricken region was not sufficient, and many heavily injured did not survive the rather long way to the nearest hospital. In the days following the Azerbaijan earthquake, the num-

ber of psychosomatic complaints increased. Surviving patients were consulted for what looked like functional disorders (presenting as headache, sore stomach, muscle aches, etc.). The psychosomatic complaints likely represented with socially more "acceptable" moral pain in this traumatized population with often little access to psychiatric care. The people reacted to these stressors by various defense mechanisms such as conversion withdrawal, denial, regression, pain, anxiety, adjustment disorder symptoms and depression. Some of them developed delirium or even more severe problems like pain disorder or acute stress disorder. Various types of psychological disturbances in trauma patients have been highlighted in Table 3.

Table 3. Different types of psychiatric disorders among trauma patients of earthquake (n=801).

	Jigha (n=138)	Shahsavari (n=87)	Aghalilo (n=122)	Ghizghapan (n=69)	Goydaragh (n=63)	Valilo (n=131)	Bajbaj (n=101)	Chobanlar (n=90)
ASD*	31%	28%	25%	14%	15%	30%	20%	22%
Anxiety	9%	13%	8%	13%	9%	15%	10%	8%
Depression	5%	8%	4%	7%	5%	2%	26%	4%
MADD**	2%	2%	5%	3%	3%	2%	11%	4%
Phobia	17%	11%	9%	8%	11%	6%	11%	9%
Aggressive	9%	3%	7%	1%	2%	24%	3%	7%
Insomnia	8%	12%	21%	9%	8%	4%	5%	13%
Psychosomatic	1%	14%	5%	4%	5%	2%	4%	6%
Normal	18%	20%	16%	41%	42%	15%	10%	35%

Health in Emergencies and Disasters Quarterly

Table 4. Multiple regression analysis to assess the correlation between selected characteristics and psychopathology occurrence.

Characteristic	Estimate	SE	t	P Value
Gender	1.031	0.272	-2.086	0.046
Age	-1.617	1.106	3.105	0.081
Injured in the earthquake	2.352	0.971	2.024	0.029
Death of at least one first-degree relative	1.016	0.213	2.953	0.001
Confronting with dead body	1.920	0.509	3.771	0.000
Receiving psychological tutorship	-1.913	0.462	4.144	0.000

To investigate the different psychological symptoms as they were measured with the SCL-90-R scale and GHQ after the earthquake, a paired test was used. Because of missing answers in SCL-90-R, or same answer in all 90 questions or fake “good or bad”, the total number of participants analyzed were 801 (Table 1). Table 3 shows some descriptive statistics of each variable and the statistical significance of the comparisons. As it can be seen from Table 3, all participants had significantly increased psychological disorders after the earthquake in some the measured symptoms and the 3 indices of SCL-90-R compared to the previous 2 months.

The results of the present study revealed a high proportion of people eligible for the diagnosis of ASD (23%). More than 10% of the samples were experiencing severe anxiety symptoms, 7.5% suffer from moderate to severe depression, and 4% were patients with MADD at the time of interview. The prevalence of depression (26%, n=101) and MADD (11%, n=101) in Bajbaj village was higher than other villages in the research zone, because that the villagers there had lost one or more family members or at least one first-degree relative. The rate of casualty in Bajbaj was 29 fatalities (Table 2) and it was first in casualty ranking among all villages. Earthquakes stir up concerns in people not directly affected. They also triggered both a desire to help and a sense of overwhelming hopelessness. These clusters of emotions, helplessness, hopelessness, and a sense of being overwhelmed are classic symptoms of depression.

Also, 7% of the total samples (n=801) showed severe aggressive behavior, but this subscale was 24% (n=131) among Valilo villagers. Data showed that Valilo villager’s respondents expressed more aggression than other villager’s respondents. This violence involved aggressive behavior towards animals, attack to volunteers, beating children and quarrel for food and basic equipment. It may be due to their culture emerged as an important factor in aggression.

The total frequency of insomnia found by this study was 10% (n=801), but frequency of insomnia in Aghalilo village was 21% (n=122) which was higher than other villages in research zone. The prevalence of insomnia increased even in regions that were at a considerable distance from the epicenter. All people in Varzaqan area, where the seismic intensity was greater, experienced insomnia after the earthquake. In Heris area, where the earthquake impact was milder, disturbing mental images may have exacerbated insomnia among adults (Table 4).

Females were significantly more susceptible to serious psychiatric morbidity than males in this study. In Azerbaijan villages, compared to males, females were more willing to acknowledge symptoms and more prone to express their symptoms. They would also demonstrate higher than average levels of symptoms and sought help more often.

Age may impact the course of the disorder; youngest are more emotionally vulnerable to the devastating effects of a disaster due to their developmental status. We conducted the survey two months after Eastern Azerbaijan earthquake, and found that 7.5% developed depression symptoms and 23% developed acute stress disorder in 801 participants related to their age.

The participants in our study had been living in a safe and peaceful environment very far from the city (Tabriz); they did not have any practical experience in dealing with big trauma and crisis. As victims and on-spot witnesses, the subjects were direct exposures, thus they were more likely to develop severe depression and even post traumatic stress disorder (PTSD) in future.

The data were analyzed with the SPSS, version 13.0.1 and the survey commands (SVY) of the statistical package Stata 8.0.

4. Discussion

The present study was designed to screen a group of Azerbaijan earthquake survivors for psychiatric symptoms. An earlier report on the prevalence of psychological disorders in this population showed that 75% (n=801) of the respondents suffered from severe mental health as measured by the GHQ-28 and SCL-90-R. The results showed that the disaster increased the psychopathology of the survivors. Only few victims had recovered (in terms of psychopathology) from the disaster during the two months time and none of the examined factors contributed significantly to their recovery. Previous research in survivors of disasters has showed that the psychological distress and psychopathology after disasters are long lasting [1-3].

Earthquakes, as a nature disaster, not only cause deaths, physical disease, damage to the infrastructure and economic loss, but also produce long-lasting mental health effects on individuals involved. There will always be cases of psychological disorders such as anxiety symptoms, PTSD, depression, cognitive disorder, psychosomatic complaints, and so on, especially with individuals dealing pre-existing conditions.

Survivors were faced with no water, no food, and no electricity. With so much damage, recovery was not easy. Some food was parachuted in, but the distribution was uneven. Water, even just for drinking, was extremely scarce. Many people drank out of pools or other locations that had become contaminated during the earthquake. Although earthquakes are among the most common and devastating natural disasters, relatively little attention has been paid to their mental health consequences and as social risk factors. Acute stress disorder, severe anxiety, and depression are common outcomes of major earthquakes.

The total prevalence of psychosomatic disorders among participants was 5% (n=801) and the prevalence of psychosomatic disorders among people in Shahsavari village was 14% (n=87). Our results confirm the relation between psychosomatic complaints and acute stress disorder, anxiety symptoms, and depression which were suggested by previous studies [12-15]. According to the literature [16, 17], women contribute more to increase the level of morbidity compared to men. Our study also shows that scores for anxiety, depression, and MADD are higher in women than men.

Around 10% (n=801) of the participants were experiencing fear of earthquake (seismophobia). This pho-

bia is often the direct result of either living through an earthquake or replaying the mental images of destruction and the internal fears of original panic. It can also be enhanced or introduced by horror stories narrated by others who have lived through an event or obsessed about the possibility of the next big earthquake. The experience of phobia, helplessness, and panic during the earthquake, and the appraisal of serious psychological, social, and economical consequences after the earthquake by the victims, were positively related to the subscale scores and the total score of GHQ and DES. Earthquake-related thoughts, fear of another large earthquake in the future (seismophobia), and being upset by minor tremors had high positive relationships to the subscales and total scales of GHQ and DES.

Thus, subjects such as Jigha villagers (17%, n=138) who scored high on these questions scored high on the subscales and total scales of GHQ and DES as well. Contrary to what was expected, the experience of having to leave one's house was related only to the arousal scale of GHQ and DES. Damage to one's property was positively related to the total GHQ and DES scores.

Many results reported in disaster literature indicate that people in the middle-age group experience more psychological symptoms than other age groups. The relationship between age and post-traumatic symptoms also may be more complicated than a question of simply old versus young subjects who show more or fewer psychological symptoms. A study by Goenjian et al. (1994) [18] reported a significant difference between the older and the younger group in scores of arousal and intrusive symptoms. The elderly had significantly more arousal symptoms and significantly fewer intrusive symptoms than the younger group. Therefore, it is not certain that older people are more vulnerable to disaster effects – more research is needed with different age groups to clarify the matter.

5. Conclusion

Although earthquakes are among the most common and devastating natural disasters, relatively little attention has been paid to their mental health consequences and associated risk factors long time after earthquake. There have been few studies of post-earthquake psychological problems using randomly selected samples of earthquake survivors. So, this article has summarized the current status of information on mental disorders caused by experiencing or witnessing a life threatening severe earthquake.

Acknowledgments

We gratefully acknowledge all people in villages of Heris and Varzaqan district such as Jigha, Shahsavar, Aghalilo, Ghizghapan, Goydaragh, Valilo, Bajbaj, and Chobanlar for their participation in this research.

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