The Prevalence of Complicated Grief among Bam Earthquake Survivors in Iran

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Earthquake is a natural disaster, which causes many psychological problems in survivors. Complicated grief is one of these sequelae. A devastating earthquake with a magnitude of 6.3 on the Richter scale destroyed the city of Bam in Kerman Province, Iran. Twenty-six thousand people were killed. Many of the survivors should have developed psychological problems in the aftermath of the disaster. In this study, we examined the prevalence of complicated grief and its correlation with the demographic factors and some suggested contributing variables. In this cross-sectional study, 400 persons were selected by stratified multistage area sampling. The survivors were interviewed in their temporary residential camp. After evaluating their demographic data, they were evaluated with the inventory of complicated grief. The cut-off point was set to 25. The mean±SD age of the participants was 37.8±12.7 years. Complicated grief was detected in 304 (76%) of the respondents. Score of complicated grief was higher among women and in those with lower educational levels. Presence in the city during the earthquake, observing burial of corpses, destruction of residential homes during the earthquake, residential problem after the catastrophe, and loss of at least one of the first relatives during previous earthquakes were variables which were correlated with the complicated grief. Existence of complicated grief in more than two-thirds of respondents requires more attention of mental health services. Rebuilding of homes and solving the residential problems of survivors are the factors, which could help survivors to find their mental health within a shorter period.

Keywords: Bam • earthquake • grief • Iran

Introduction

An earthquake with a magnitude of 6.3 on the Richter scale occurred in Bam—a city in the East of Kerman Province, Iran—on the December 26th, 2003 at 5:26 AM local time. Over 26,000 people died as reported by the National Organization for Civil Registration of Iran. Many homes have been destroyed.1

Worldwide earthquakes have caused more than a million deaths and billions of dollars loss in property during the past 20 years.2 The earthquake magnitude, population density, degree of preparation for earthquake, strength and design of buildings, and physical disability are the major factors in earthquake-related destructions and mortalities.3

Most of the buildings in Bam were made of sun-dried bricks and, therefore, we were very weak, as a result many of them were completely destroyed during the disaster. At the time of earthquake, many people were asleep and had no chance to leave their home quickly. All these factors made the number of dead very high. People of Bam have very strong familial relationship and it is predictable that many survivors would be suffered from significant psychological distresses.

In this research, we measured the complicated grief among the survivors. Grief is not a mental disorder. It is a painful and unexpected process in response to the death of a family member or a beloved one. If the grief process is not resolved in
due time or complicated with a psychiatric disorder the term "complicated grief" is applied.\textsuperscript{4}

**Patients and Methods**

In a cross-sectional study, 400 survivors of Bam earthquake aged 15 years and over were included. To select a representative sample of individuals living in Bam, a stratified multistage area sampling was used. Interviewers collected data, months after the earthquake in a month and all the participants were interviewed in their camp. Survivors who were volunteers were included. Survivor's demographic data including age, gender, level of education, marital status, and income were asked first. Then, factors based on our clinical experience which were suggested to be correlated with complicated grief were evaluated. These factors were 1) presence in the city at the time of earthquake; 2) being asleep during earthquake; 3) observing burial of corpses; 4) existence of death of one of the first relatives before earthquake; 5) destruction of residential home; 6) being physically injured during the disaster; 7) residential problems after earthquake; 8) being buried under rubble; and 9) loss of at least one of the first relatives during earthquake. Complicated grief was measured by the inventory of complicated grief (ICG). This inventory was developed to assess a distinct cluster of symptoms that have been found to predict long-term dysfunction and was based on previous literatures, in which certain symptoms of complicated grief were found to be distinct from symptoms of depression and anxiety.\textsuperscript{5} The ICG items were selected based on clinical experience with bereaved persons and on seven symptoms that were found to have loaded highly on the grief factors. This scale includes 19 items, which should be scored from 0 to 4. Respondents who took score 25 or higher were considered to have complicated grief. The validity of translated items was evaluated by four academic members of the Psychiatric Department. A trial for the evaluation of its face validity and editing was done by assessing 10 survivors. Reliability of ICG was acceptable (Cronbach's $\alpha = 0.88$). Data were analyzed with SPSS version 10, using multiple regression and Student's $t$-test.

**Results**

In this study, 400 survivors (211 [52.8\%] males and 189 [47.2\%] females) of Bam earthquake aged 15–70 years were studied. The mean±SD age of the participants was 37.8±12.67 years. One hundred and eighty-four (46\%) were single, divorced or widowed and 213 (54\%) were married. Thirty-two (8\%) persons were illiterate, 80 (20\%) were graduated from primary school, 210 (52.5\%) were high-school educated, and 78 (19.5\%) had academic educations. The income of 136 (34\%) persons was less than almost US$ 100 per month; 59 (14.8\%) earned more than almost US$ 300 per month and 205 (51.2\%) earned between US$ 100 and 300 per month before the earthquake. Complicated grief was detected in 304 (76\%) of the participants. One hundred and seventy-two (91\%, CI95\%: 85.3 – 94.2\%) of women and 132 (62.6\%, CI95\%: 55.5 – 68.9\%) of men had complicated grief. The results of multiple regression analysis for evaluating the correlation between all variables and the score of complicated grief are shown in Table 1. Women had a higher score of complicated grief than men. Subjects with lower education had higher score of complicated grief. Five of nine variables, which were first suggested to have correlation with complicated grief, were proved to be so.

**Discussion**

In general, normal grief is considered as a typical or unusual reaction to bereavement. It is assumed to be followed by a gradual return of the capacity for reinvestment in new interests, activities, and relationship. Complicated grief is considered as certain maladaptive reactions to bereavement assumed to be a manifest of psychological and physical impairments.\textsuperscript{6}

Major depressive disorder (MDD) and post-traumatic stress disorder (PTSD) are two psychiatric disorders, which are well-known complications in the survivors of earthquakes. Many studies among survivors of disasters like earthquakes were focused on these two categories, for example following an earthquake in center of Taiwan, which caused more than 2000 deaths, there were a prevalence of 37\% of PTSD and 16\% of MDD.\textsuperscript{7} Complicated grief is one of the psychiatric complications among survivors of disasters. It can also occur in any bereaved individual. Jacobs concluded that about 20\% of acutely bereaved individuals develop clinical complications and named it complicated grief.\textsuperscript{8} It is possible that complicated grief will either become a separate category, or that bereavement...
will be incorporated, for example, as a stressor within a category of even-related disturbances, including PTSD, in the next edition of diagnostic and statistical manual of mental disorders (DSM) (and/or international classification of mental disorders (ICD)).

Score of complicated grief was higher among women and survivors with lower educational level. In a research which was done in survivors of earthquake in Turkey, female gender, lower education, and lower socioeconomic status were found to be correlated with higher rates of PTSD and depression.

Most, if not all, of people never totally resolve their grief and significant aspects of the bereavement process persist for years after the loss. In this study, we tried to study some of the suggested contributing factors, which could be correlated with complicated grief. We found no correlation between age, marital status, and income with the complicated grief. We also found that presence in the city during earthquake, observing burial of corpses, destruction of residential homes, residential problems after earthquake, and loss of at least one of the first relatives during earthquake were statistically significant contributing factors to developing complicated grief. These factors can help rescuing systems for planning more effectively at risk individuals. Rebuilding the destroyed houses as soon as possible is suggested as an important factor, which could improve survivors’ mental health.

We did not find any correlation between other evaluated nine factors and complicated grief in this research.

Experience of stress (being present in the city) was correlated with increasing score of complicated grief. We concluded that PTSD and complicated grief may have similarities in their origin and could be correlated with each others in the survivors of earthquake.

One of the shortcomings of the present study was that we did not evaluate the symptoms of PTSD and so it is not possible to comment further on this issue.

In one previous research regarding psychological consequences of Bam earthquake using general health questionnaire (GHQ12), the authors reported that 58% of the respondents suffered from severe mental health problems. We thought that for evaluation of long-term psychological problems in survivors of earthquake, we need more research. As Iran is located on the earthquake belt, we should expect other devastating earthquakes in future. As much as we know about psychological problems after earthquake, we can improve the quality of mental services to survivors and decrease the long-term psychological sequelae.

### References

1. National Organization for Civil Registration of Iran. Many homes have been destroyed. Available from: URL: www.nocr.ir.
