Post Traumatic stress Disorder and General Symptoms of Anxiety in Adolescent Survivors of Bam Earthquake

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Objective: Reports of the prevalence of PTSD has been variable between 28-70% after the earthquake disaster in the city of Bam, among children. Several studies in adults have shown a high comorbidity of anxiety disorders as well. In this study we evaluated the frequency of PTSD and anxiety symptoms among adolescents in the period of 7-9 months after a large scale disaster (Bam earthquake).
Method: In an epidemiologic study, we evaluated the PTSD and the severity of general symptoms of anxiety in adolescent survivors of Bam earthquake who had been directly exposed to the traumatic event. We used DSM-IV criteria and Posttraumatic Stress Scale (PSS) for PTSD diagnosis and Hamilton Anxiety Rating Scale for evaluation of the anxiety symptoms.
Results: 284 adolescents at the ages of 11 to 18 with a mean age of 14.8 (SD=2.1) were recruited. 45.1% had PTSD and there were no statistical differences between boys and girls for PTSD symptoms. The girls had more anxiety symptoms than the boys.
Conclusion: One half of the adolescent survivors of Bam earthquake had post traumatic stress disorder. The girls had more anxiety symptoms.
Key words:
Adolescent, Anxiety, Depression, Iran, Natural disaster, Post-Traumatic Stress Disorder

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PTSD occurs as a result of exposure to severe stressors such as natural disasters (1,2). In a study in Turkey on 430 earthquake survivors, the occurrence of PTSD was directly related to the degree of closeness and the exposure of people to the event (3). Therefore, the level of exposure was one of the main predictors of trauma-related mental disability (4) . . Also, in a study in Germany on 3021 people, 26% of males and 17.7% of females had experienced at least one traumatic event and the prevalence of PTSD among them was 1% and 2.2% for male and female subjects respectively (5). In addition to the previous estimations that were performed for the adult population, since PTSD has also been described for the children and adolescent population (6), some studies have reported estimations of PTSD prevalence in these latter groups as well. In a study on 384 adolescents, 40% had been exposed to at least one traumatic event before the age of 18, and 14.5% had a diagnosis of PTSD (7). Females were more vulnerable to PTSD than males (8). In one study, the prevalence of PTSD was reported to be 1% and 3% in boys and girls respectively (9). The Comorbidity of psychiatric disorders is another factor that complicates this mental disorder (10). According to the results of one study on 300 adolescents, PTSD symptoms had increased the risk of other psychiatric disorders such as depressive and anxiety disorders as well as alcohol dependency (6). Other studies have indicated the comorbidity of generalized anxiety disorder, specific phobia and panic disorder. These studies have also shown the manner in which the comorbidity is related to the characteristics of the community and the trauma itself (11). Most studies have reported that these comorbidities heighten the morbidity rate of the survivors subsequent to a disaster (12). Although we know that the comorbidity of anxiety symptoms with PTSD in adolescents is common, the severity of these anxiety symptoms is unknown. In this study, we assessed the frequency of PTSD and the severity of anxiety symptoms in adolescent survivors of Bam earthquake at months 7-9 after the disaster.

Material and Methods

As a part of a more developed study, by using a descriptive method in months 7-9 after the Bam earthquake, we studied the frequency of PSTD and the severity of general symptoms of anxiety in adolescents at the ages 11 to 18.

All of the participants had a history of a personal and direct exposure to the event and had been damaged by it. Mental retarded persons and all those who did not agree to participate were excluded from the study. Since the population distribution was unknown and we did not know the proportion of children and adolescents to the overall population, we had to carry out the sampling by the following method:

The affect areas were divided into 13 regions, of which 2 urban, 2 rural, and 2 camping regions were randomly

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Table 1: The frequency percentage of reexperiencing symptoms in participants

Symptoms	PTSD group			Non PTSD group			Total		
	Boys n=28	Girls n=100	Total n=128	Boys n=41	Girls n=115	Total n=156	Boys n=69	Girls n=215	Total n=284
Intrusive recollection of the event	75	70	71.1	48.8	48.7	48.7	59.4	58.6	58.8
Recurrent distressing dreams or Nightmares	53.6	52	52.3	24.4	31.3	29.5	36.2	40.9	39.8
Acting or feeling as if the event were recurring	78.6	75	75.8	31.7	31.3	31.4	50.7	51.6	51.4
psychological distress at exposure to the event cues	92.9	80	82.8	56.1	55.7	55.8	71	67	68
Physiologic reactivity to the event cues	46.4	54	52.3	4.9	20.9	16.7	21.7	36.3	32.7

Table 2: the frequency percentage of avoidance symptoms in participants

Symptoms	PTSD group			Non PTSD group			Total		
	Boys n=28	Girls n=100	Total n=128	Boys n=41	Girls n=115	Total n=156	Boys n=69	Girls n=215	Total n=284
Effort to avoid trauma associated thoughts, feelings …	75	48	53.9	24.4	20	21.2	44.9	33	35.9
Effort to avoid trauma associated activities, places …	42.9	52	50	17.1	19.1	18.6	27.5	34.4	32.7
Inability to recall important aspects of trauma	53.6	38	41.4	22	15.7	17.3	34.8	26	28.2
Marked diminished interest in significant activities	85.7	79	80.5	14.6	19.1	17.9	43.5	47	46.1
Feeling of attachment from others	50	64	60.9	19.5	21.7	21.2	31.9	41.4	39.1
Restricted range of affect and unable to have loving feeling	75	88	85.2	29.3	33	32.1	47.8	58.6	56
Sense of a foreshortened future	64.3	62	62.5	7.3	16.5	14.1	30.4	37.7	35.9

selected. Demographics were recorded in a designed questionnaire. Posttraumatic Stress Scale (PSS) (13) and Hamilton Anxiety Rating Scale (HARS) (14) were used to assess PTSD and anxiety symptoms respectively. PSS is a 17-item scale with 3 subscales on symptoms of re-experiencing, avoidance, and arousal, as well as questions on loss of function and duration of the disorder. Severity of symptoms is scored from zero to 3 in an increasing order. In a prior pilot study on validation of PSS in the Iranian population, a Cronbach's alpha of 0.84 was determined. Its reliability with K-SADS (15) semi-structured interview, with a cut-off point of 2 for each symptom, was 0.92.

This cut-off point was the strongest diagnostic association. HARS consists of 13 questions divided into 2 groups of questions on psychological and somatic symptoms of anxiety, scoring 0–4 in an increasing fashion, which should be completed by the interviewer. This scale is suitable for the rating of general symptoms of anxiety in adolescents (16) and has been previously used in the Iranian population.

In addition to the PSS and HARS, we recorded demographic properties such as age, sex, and education. We reported the frequency of PTSD symptoms and the severity of the anxiety symptoms and compared them according to age groups with the appropriate statistical analysis (Independent sample T Test and Mann Whitney).

Results

284 adolescent survivors of Bam earthquake (aged 11 to 18 years, mean age 14.8±2.1) were enrolled in the study. Boys and girls comprised 24.3% (n=69) and 75.7% (n=215) of the overall subjects respectively. Their mean level of education was 8.3±2.3 grades. At the time of study 79.2% (n=225) were students; also 5.6% (n=16) and 15.1% (n=43) were employed and unemployed respectively. From the participants 37% (n=105) had settled in rural areas, 23.6% (n=67) in urban areas and 39.4% (n= 112) in camps. All subjects had witnessed the earthquake: 24.6% (n=70) had been entrapped, 20.1% (n=57) had suffered physical injuries and 4.2% (n=12) had permanent physical disability. Sixty-seven adolescents (23.6%) had lost at least one first-degree relative in the catastrophe.

PSS results revealed that 5.3% (n=15) had no PTSD symptoms. Also 3.5% (n=103) had one and 1.1% (n=3) had full symptoms of PTSD. The mean score for PTSD symptoms was 7.5±4.2 in participants. 87.3% (n=248), 55.3% (n=157) and 63.4% (n=180) of participants had

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Table 3: the frequency percentage of hyperarousal symptoms in participants

Symptoms	PTSD group			Non PTSD group			Total		
	Boys n=28	Girls n=100	Total n=128	Boys n=41	Girls n=115	Total n=156	Boys n=69	Girls n=215	Total n=284
Difficulty falling or staying sleep	46.4	60	57	29.3	20.9	23.1	36.2	39.1	38.4
Irritability or outburst of anger	71.4	86	82.8	34.1	38.3	37.2	49.3	60.5	57.7
Difficulty concentrating	78.6	75	75.8	22	27.8	26.3	44.9	49.8	48.6
hypervigilance	78.6	60	64.1	14.6	19.1	17.9	40.6	38.1	38.7
Exaggerated startle response	82.1	67	70.3	22	31.3	28.8	46.4	47.9	47.5

at least one of the re-experience, avoidance and hyper arousal symptom clusters respectively; 128 subjects (45.1%) had the full diagnostic criteria for PTSD, and the others had sub-threshold symptoms. The Mean scores for re-experience, avoidance and hyperarousal symptom frequencies in participants were 2.5±1.5, 2.7±1.9 and 2.3±1.6 respectively. There was no statistical difference for the mean total PTSD symptom frequency and symptom clusters of PTSD between the two gender groups according to Mann-Whitney analysis (p>0.05). Table 1 to 3 summarizes the frequency of PTSD symptoms. The mean severity of PTSD according to PSS scale was 23.4±10 and the mean severity for re-experiencing, avoidance and hyperarousal symptoms were 7.6±3.4, 8.8±4.6 and 7.6±3.4 respectively. The independent sample t-Test, did not show a statistically significant difference between boys and girls (p>0.05).

According to the Hamilton Anxiety Scale, mean score of general anxiety symptoms was 16.7%±10.9 for all the subjects. Mean score for psychological and somatic symptoms of anxiety were 9.02±5.4 and 7.7±6.5, respectively. The mean scores for anxiety symptom severity were 17.7±11.1 and 13.4±9.8 in girls and boys which was statistically significant (p=0.004). Mean score psychological symptoms in girls was more than boys (9.7±5.5 and, 6.7±4.4,P=0.00). The statistical differences for the severity of somatic symptoms was significant too (8±6.5, 6.6±6.4 in girls and boys respectively, P=0.013). Mean score for anxiety symptoms was 22.7%±10.9 and 11.8±8.1 for PTSD and non PTSD groups respectively. In the PTSD group mean anxiety symptoms was 23.6%±10.8 and 19.3±10.8 for girls and boys respectively in the PTSD group, (p=0.065), and 12.6%±8.5 and 9.4±6.6 (p=0.031) in the non-PTSD group, In the PTSD group the mean psychic symptoms for boys and girls were 8.7±4.4 and 12.7±5 (p=0.00) and mean somatic symptoms were 10.5±7.4 and 10.9±6.9 respectively (p=0.79). Also in the non-PTSD group mean psychic symptoms for boys and girls were 5.4±3.5 and 7.1±4.5 (p=0.032) and mean somatic symptoms were 4±3.8 and 5.5±4.9 respectively (p=0.087).

Discussion

This study was performed on subjects who had experienced a large scale natural disaster and its results are important because it assessed the frequency of PTSD symptom clusters and the severity of anxiety symptoms in a group of adolescents in months 7-9 after the earthquake. Therefore, the results of this study can be used in evaluating the degree of mental disability as well as for programming proper interventions in similar situations.

Most of the participants in this study were girls. Boys were more reluctant to cooperate. Also, since this study was carried out in the summer, at the time of assessment most of the boys had joined the farming activities and were not present at homes. Based on the results, there was a homogenous distribution of people over urban, rural and camp areas. The results show that 20 to 25% of participants had experienced severe forms of exposure such as being under debris, suffering physical injuries and first degree relative losses.

We noticed that in this 3-month period (months 7–9) following the earthquake, 45.1% of the subjects had PTSD, and the remaining 55% despite not having met the criteria for a diagnosis of PTSD, experienced subthreshold symptoms of the disorder. Most of the participants had at least one of the re-experience symptoms, among which psychological distress at exposure to trauma cues, intrusive recollections of the event and flash backs were the most frequent. The most frequent avoidant symptoms were restricted range of affect, markedly diminished interest and feeling of detachment. This distribution of symptoms was similar between PTSD and non PTSD subjects as well as the gender groups. Irritability or outburst of anger, difficulty concentrating and an exaggerated startle response were also the most frequent hyperarousal symptoms. These ratios were the same in PTSD and non PTSD groups with a small difference between boys and girls.

These results suggest that the frequency of PTSD symptoms is independent of gender. However because of a higher participation of girls in this study, the results must be interpreted more cautiously. Considering the standard deviation of 10.9, about 65% of the subjects had remarkably severe anxiety

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symptoms especially for psychological symptoms with a higher severity in girls than in boys.

Based on other studies, it is estimated that 18.3% of the people exposed to such trauma are affected by PTSD (4). In a study in Taiwan, 21.7% of 323 earthquake survivors had symptoms of PTSD (17). However, the prevalence of PTSD from natural disasters ranges from 2.5–33% in adults and 28–70% in children (18).

Another study showed that in 59 of 100 children and adolescents who had a history of trauma and had been referred to the clinic, 22% completed full PTSD criteria, and 32% and 46% had less and no symptoms respectively. In this study there was no difference in the severity of reaction to trauma according to gender, sex and ethnicity (17).

Among 1264 adolescents at the ages of 11 to 17, the prevalence and frequency of PTSD symptoms was assessed one year after a hurricane. Results showed that 20%, 9% and 18% of participants had re-experience, avoidance and hyperarousal symptoms respectively; and according to the gender and race the rate of PTSD ranged between 1.5% and 6.2% (19) . In a study on a sample of females at the ages 16 to 22 years, 70% of traumatic subjects had at least one re-experience and 30% had 3 avoidant PTSD symptoms. These results are consistent with our findings (9) . In Vietnam a study showed that the comorbidity of MDD, Bipolar disorder, Panic diosrder and Social phobia were high in 311 combat related PTSD patients (10). Also, according to the results of a study on college students who had been exposed to traumatic experiences, more anxiety and depressive symptoms were reported (20). Comorbidity related studies have also suggested that the incidence of anxiety symptoms is related to the course of PTSD (21).

Limitations:

Since most anxiety symptoms are analogous to hyperarousal symptoms of PTSD, the similarity of PTSD and anxiety symptoms is one of the limitations of this study, which makes the differentiation of these symptoms more difficult. But according to DSM_IV criteria, PTSD includes only some anxiety symptoms, and it is important to have an estimation of general anxiety symptoms severity. Therefore, in this study the use of HARS, which makes possible to rate anxiety symptoms with the exception of those present in PTSD and OCD, may be helpful. However, the results must be interpreted with caution. Method and timing of sampling (during the day, and at men's working hours) that resulted in a higher proportion of participation of girls in the study population are among the limitations. Given that sampling was not done using the cluster method, and that the inpatients in hospitals and rehabilitation centers as well as the adolescents in welfare centers were not included, and also due to some other unknown interfering factors that might have affected the results, the generalization should be done with caution. For future studies, we suggest the use of more comprehensive questionnaires and cluster sampling methods.

Conclusion

About half of the adolescents who were exposed to the trauma of Bam earthquake had PTSD in months7-9, with no differences according to gender. However, the severity of anxiety symptoms was greater in girls.

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