

# **Trauma, Depression, Anxiety, and Stress among Individuals Living in Earthquake Affected and Unaffected Areas**

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Earthquake of 8<sup>th</sup> October 2005 affected many regions in Pakistan. After about a year of the earthquake trauma, depression, anxiety, and stress were studied among 600 individuals (300 from the three earthquake affected areas and a comparable number from three unaffected areas). Urdu translated version of Impact of Event Scale (Aslam, 2007); Urdu translated version of Depression, Anxiety, Stress Scale (Aslam, 2007); and Ego-resiliency Scale (Nangiana, 2002) were used. Significant differences were observed between participants of affected and unaffected areas on all the variables studied. In affected areas, married individuals scored significantly higher on the variables of trauma, depression, and stress as compared to unmarried individuals and women scored higher on the variable of stress as compared to men. The construct of ego-resiliency explained its inverse relationship with the levels of PTSD, depression, anxiety, and stress observed among individuals living in affected and unaffected areas. Practical implications were discussed and suggestions for future research were made.

*Keywords:* depression, anxiety, stress, disaster, resilience, Post Traumatic Stress Disorder

Disasters are traumatic events that are dangerous, overwhelming, and usually sudden. These are overwhelming because these test the capability of the community and individuals to cope with a massive disruption. Survivors of natural disasters, as well as the ones caused by human beings such as acts of rape, violence, war, and terrorism, share an enormous experience and come to view the world around

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them in new and different ways. Some psychological damage to individuals and small or even large groups of human beings is inevitable (Norris, Friedman, & Watson, 2002).

Humans have been victims of disasters throughout recorded history. On the average, a disaster occurs somewhere in the world each day (Norris et al., 2002). During their lifetime, 51.2% of women and 60.7% of men are estimated to have experienced at least one traumatic event. Where human sufferings caused by disasters could be immeasurable, these may exact a heavy toll on human life as well. On the average, about 510 people lose their lives in disasters in the United States each year. In the year 2001, over 3,000 people lost their lives in the terrorist attacks of 9<sup>th</sup> September 2001. Globally, 128,000 lives are lost annually in disasters and 85% of approximately 3 billion people in the world affected by disasters from 1967 to 1991, lived in Asia (Myers & Wee, 2005). The occurrence of a natural disaster in a community is thus traumatic for the most and proves to be a large-scale environmental stressor because it is sudden, unexpected, and damage life and property to a great extent.

Exposure to disasters and other stressful life events not only has physiological effects as documented, for example by Selye (1976) and others, but these also have psychological effects. Previous disaster research has examined a variety of situations, including a hurricane, tsunami, etc. (Kumar, Murhekar, Hutin, Ramachandran, & Gupta, 2007; Mills, Edmondson, & Park, 2007). A number of investigators (e.g., Epstein & Erksine, 1983) have reported that exposure to traumatic and stressful events can threaten, destabilize, invalidate, and even shatter an individual's fundamental beliefs and implicit assumptions about him or herself and about the world. Baum, Fleming, and Davidson (1983) observed that while most individuals, who experience natural disasters, combat, and other major stressors, may later cope adequately, but a considerable percentage (estimated to be between 20% to 40% depending on the nature of stressor) experiences continual chronic stress and some may continue trauma called posttraumatic stress disorder (PTSD).

Goenjian et al. (2001) observed severe forms of posttraumatic stress and depressive reactions among Nicaraguan adolescents six months after Hurricane Mitch. These and similar findings suggest that catastrophic earthquakes have long-term psychological consequences, particularly for survivors with high levels of trauma exposure (Li, Rao, & Ren, 2009; Salcioglu, Basoglu, & Livanou, 2003). In a cross-sectional study, with multi-cluster sample, two affected areas after the Wenchuan earthquake in China, the prevalence of suspected PTSD was 45.5% (Kun et al., 2009). In another study with tsunami,

survivors experienced stressor known to have adverse effects on the mental health; especially the severe distress was seen (Bhugra & Van Ommeren, 2006). Hsu, Chong, Yang, and Yen (2002) find the prevalence rate of 50% in adolescents.

The American Psychiatric Association (APA, 2000) defines a traumatic event as psychologically distressing outside the range of usual human experience markedly distressing to almost any one. Furthermore, a traumatic experience caused by a disaster may entail two elements—actual or threatened death or serious physical injury to the individual or to others, and intense fear, horror, and helplessness because of massive destruction and terrible sights. Among victims of major disasters, PTSD is commonly observed, singly or in conjunction with one or more of different psychological disorders such as acute stress disorder, anxiety, and depression even after years of disaster or a traumatic experience (see for example, Kulka et al., 2003). Kumar et al. (2007) noted the high prevalence of PTSD in a coastal fishing village in Tamilnadu, India, after the December 2004 tsunami. PTSD is perhaps the severest of all of these psychological reactions. Persons suffering from it experience event or events that involved grief over loss of loved ones and valued and meaningful possessions, fear, helplessness, anxiety, sleep disturbances often including nightmares, horror and recurrent and intrusive distressing recollections of the event, images, thoughts, or perceptions or/and distressing dreams of the event (APA, 2000).

PTSD occurs in 32% to 60% of the adult survivors and 26% to 95% of the child survivors studied soon after different earthquakes (Norris, 2001). The PTSD rates were between 11% to 40% and 3% to 19% 6 months and 2 years after the Newcastle earthquake in Australia, respectively (Carr et al., 1997). The estimated rates of PTSD and major depression were 39% and 18%, respectively, among earthquake survivors living in prefabricated housing sites after the 1999 earthquake in Turkey (Basoglu, Salcioglu, & Livanou, 2002). In another study, Livanou et al. (2007) noted that exposure to earthquakes is associated with the development of PTSD and depression. Earthquake-related fears play a critical role in the development of PTSD.

Depression is an inextricable element of PTSD, and people having it after the disasters lose interest in life, are irritable, suicidal, or withdrawn from the normal activities of life. The lifetime prevalence rate for major depressive disorder co-occurring with PTSD in a large US epidemiological study of young adults was 36.6%. In the same study, the rate of major depression amongst those exposed to trauma, but not suffering PTSD was 13%. This was not any

dramatically higher than those who had not been exposed to trauma (10.1%). From a US community sample of more than 5,800 people, Kessler, Sonnega, Bromet, and Hughes (1995) found 48.2 % of people suffering PTSD, and had a co-morbid major depressive illness. Mills et al. (2007) found higher prevalence of trauma and stress response among hurricane Katrina evacuees. The rates of depression after earthquakes range between 9% and 79% and exclusively for anxiety about 6% (for similar findings see Basoglu, Salcioglu, & Livanou, 2002).

Self-reported symptoms of anxiety after a disaster are usually elevated. Although, less prevalent than PTSD or major depression disorder, generalized anxiety disorder has been diagnosed at higher than normal levels in disaster-stricken samples when structured diagnostic measures were used. Death anxiety, phobias, and panic disorder have been assessed and observed occasionally in samples of disaster victims (Armenian et al., 2000).

Disasters like earthquakes thus tend to produce a series of events that continue to affect people's lives over a prolonged period. Persistent or recurring disruptions from the earthquake substantially contribute to continued mental-health problems. General psychological distress levels following an earthquake appear to stabilize after about 12 months, but posttraumatic stress reactions do not stabilize until 18 months after the earthquake. In some individuals, there is a high likelihood of permanent psychological symptomatology following earthquake exposure. This is particularly true of those who have the highest level of exposure and the greatest concentration of personal loss and damage associated with the earthquake. In fact, individual trauma in disaster is defined as a shock that poorly affect and destruct the defense mechanisms of the individual, while, collective trauma damages the social bindings of an individual in the community (Erikson, 1976). The most common trauma was loss of property (65%), loss of life (9%), and multiple losses (Griensven et al., 2006; Livanou et al., 2005).

The variability in the number of persons who experience PTSD and other forms of stress disorders as a consequence of exposure to any disaster could be because of methodology differences and limitations. Lack of control groups, probability sampling, and classification of subjects into various age groups are some of the intervening and confounding variables in studies investigating the effects of disasters. However, disaster-related factors (e.g., injury, relocation) and certain demographic variables like gender; ethnicity may also determine the extent and intensity of adverse effects of

disasters on individuals and communities (Breslau, Davis, Andreski, & Peterson, 1991).

Norris et al. (2002) in a review study found that there is a statistically significant gender difference in post-disaster psychological distress and other psychological complaints. On the basis of these studies they concluded that females were more adversely impacted. Women and girls were especially vulnerable to developing stress, and twice as vulnerable as men and boys. In reviewing 19 articles regarding the contribution of family factors in the development of pathology, they found that married status is actually a risk. Norris and Uhl (1993) concluded that marital stress increases after disaster.

Natural disasters may cause bigger damages in parts of the world where poverty, disease, and civil strife have already weakened the local capacity for coping with adversity (Blanco, Villalobos, & Carrillo, 2006). Moreover, both social and individual personality factors are important to consider in studying the extent to which disasters affect the psychological and physical health of survivors (Galea, Nandi, & Vlahov, 2005; Morgan, Scourfield, & Williams, 2003). Post-disaster life experiences and social support are perhaps the most important ones. What has an individual or the community undergone after the disaster may continuously modulate the survivors' own perceptions of their sufferings and hence which in turn, may contribute significantly to the development and manifestation of certain psychological disorders. Korsching, Donnermeyers, and Burdge (1980) observed that the new, unfamiliar environment after disaster, accompanied by the loss of social support network of the pre-disaster community, can lead to the development of numerous social and emotional problems (see, for example, Norris et al., 2002). Same sort of emotional problems were seen in adolescents affected by tsunami disaster in Tamil Nadu (Prashantham, Sushila, Swamidhas, & Russell, 2007).

At individual levels, coping with stress by using avoidance measures (e.g., withdrawal from the situation, isolation, trying to avoid further stressors) appears to contribute to continued distress and posttraumatic stress. Older people and those with a prior history of mental-health problems seem to be at greater risk than others for experiencing posttraumatic stress following an earthquake. Flynn and Nelson (1998) observed that rescue workers with high levels of catastrophic exposure and individuals who, in reaction to the earthquake, tend to "dissociate," or become "numb," and have a sense of being detached from their emotions and bodily experiences for a

prolonged period of time are slow to recover from traumatic experience of a disaster. Lastly but quite importantly, resilience, a capacity for successful adaptation, positive functioning, or competence despite high risk, chronic stress, or prolonged or severe trauma has been considered as a potent protective factor against the adverse effects of disasters (Egeland, Carlson, & Stroufe, 1993). Block and Block (1980) call it *ego-resiliency* which, according to them, is the ability to adapt one's level of control temporarily up or down as circumstances dictate. As a result of this adaptive flexibility, individuals with a high level of resiliency are more likely to experience positive affect, and have higher levels of self-confidence and better psychological adjustment than individuals with a low level of resiliency. When confronted by stressful circumstances, individuals with a low level of resiliency may act in a diffused manner resulting in a kind of behavior which is likely to be maladaptive (Block & Kremen, 1996).

A report jointly prepared by Asian Development Bank and World Bank (2005) describes that the earthquake that struck on October 8, 2005 left widespread destruction, killing at least 73,000 people, severely injuring another 70,000. It destroyed 203,579 units of housing, damaged another 196,574, and left an estimated 2.8 million people in need of shelter. Of the total housing stock, 84% was damaged or destroyed in Azad Kashmir and 36% was damaged or destroyed in North West Frontier Province.

In Pakistan, earthquake on October 8, 2005 dramatically impacted the lives of thousands of people. The traumatic effects resulting from the earthquake have been presented in numerous articles in newspapers. Present study was undertaken after about a year of the disaster. The nature of psychological disorders among earthquake affected individuals is discussed in the present study; and the comparison of the individuals who lived in earthquake-affected areas with those who were living at unaffected areas at the time of disaster is carried out. The study also aims at to see the differences along marital status and gender on the variables of the study including trauma, depression, anxiety, stress, and ego-resiliency among the individuals living in affected areas. The study was conducted to test the following hypotheses:

1. Ego-resiliency among individuals living in affected areas is inversely related to their levels of PTSD, depression, anxiety, and stress.
2. Levels of PTSD, depression, anxiety, and stress are higher in individuals living in affected areas as compared to individuals living in unaffected areas.

## Method

### Sample

The sample was selected by using purposive sampling technique. In total 600 individuals participated in this study. Three hundred of them were living in three most earthquake affected areas, namely districts Mansehra, Muzaffarabad, and Bagh. An equal number of individuals were taken from unaffected areas of districts Attock, Jehlum, and Mirpur. Their age ranged from 15-55 years ( $M = 30$ ,  $SD = 2.47$ ). Only the educated individuals were included as the participants of the study. The education level of the sample ranged between 10<sup>th</sup> grades to postgraduate. The inclusion criteria for the individuals from affected was one who was present in the affected area when the earthquake struck. From affected areas, 188(62.7%) men and 112(37.3%) women; and from unaffected areas, 167(55.7%) men and 133(44.3%) women participated in the study. Sample included 65% married and 35% unmarried participants from affected areas; and 58.7% married and 41.3% unmarried participants from unaffected areas.

### Instruments

**Impact of Event Scale (IES).** This scale developed by Horowitz, Stinson, and Field (1991) and Urdu translated by Aslam (2007) was used to measure PTSD among earthquake victims. The IES scale consists of 15 items, 7 of which measure Intrusive symptoms (intrusive thoughts, nightmares, intrusive feelings, and imagery), 8 tap Avoidance symptoms (numbing of responsiveness, avoidance of feelings, situations, and ideas), and also provide a total Subjective Stress Score. It is 4-point rating scale. All items are positively scored. The possible scores range is from 0 (*not at all*) to 5 (*most of the time*). Higher the score on the scale would indicate the severity of the problem and vice versa. All items of the scale are positively scored. The Alpha reliability of IES is .80 (Horowitz, Stinson, & Field, 1991). The alpha reliability of the Urdu version scale is .72 (Aslam, 2007).

**Depression, Anxiety, Stress Scale (DASS).** It is a 42-item self-report measure of anxiety, depression, and stress developed by Lovibond and Lovibond (1995) which has been used in diverse settings. An Urdu translated version (Aslam, 2007) was used in the present study. DASS has three subscales, each subscale contains 14 items, the Depression Scale assesses dysphoria, hopelessness,

devaluation of life, self-deprecation, lack of interest/involvement, anhedonia, and inertia. The Anxiety Scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The Stress Scale is sensitive to levels of chronic non-specific arousal. It assesses difficulty in relaxing, nervous arousal and being easily upset/agitated, irritable/over-reactive, and impatient. There is a set of cut-off scores for defining mild, moderate, severe, and extremely severe scores for each of the scales. It is 4-point rating scale with response category ranging from 0 (*Did not apply to me at all*) to 3 (*Applies to me most of the time*). All items of the scale are positively scored. Higher the score on each subscale would indicate higher the level of pathology. The alpha values for the subscales are .84, .82, and .87 for Depression, Anxiety, and Stress, respectively (Lovibond & Lovibond, 1995). The alpha values of the Urdu translated scale were .72, .74, and .76 for Depression, Anxiety, and Stress, respectively (Aslam, 2007).

**Ego-Resiliency Scale (ERS).** Developed by Block and Kremen (1996), it is a short inventory scale to assess (trait-based) psychological resilience defined as the capacity of the individual to effectively adjust to frustrating or stressful life encounters. Urdu translated version of ERS (Nangiana, 2002) was used in the present study. The ERS has 14 items and each question require a response on 4-point scale ranging from 1 with the answer *does not apply at all* to 4 with the answer *applies very strongly*. The maximum score can be 56. All items of the scale are positively scored. Those who score low on this measure are expected to experience more emotional distress or problems compared to those who score high when adversity is controlled. Sample items include "I quickly get over and recover from being startled"; "I enjoy dealing with new and unusual situations." Alpha coefficient was .81 and the test-retest reliability was .67 (Block & Kremen, 1996). The scale was checked for face validity by the authors before using it in the present research.

## Procedure

The participants were personally approached by the first author individually through schools, colleges, government, and private organizations. After having the required consent, the three scales were given to the respondents asking them to read each statement carefully and respond to all items of the scales. All to measures were administered individually following the sequence of IES, DASS, and ERS. Participants filled the scales in the presence of the researcher. The researcher answered questions seeking clarification of certain



items briefly. For the demographic information i.e., age, sex, education, and locality of residence, a separate sheet was filled up by each participant. Confidentiality of information and its restricted use for research only were assured.

## Results

Table 1 shows the relationship of Resiliency with Depression, Anxiety, Stress, and Trauma calculated through Pearson Product Moment Correlation in both affected and unaffected areas.

The relationship of depression, anxiety, stress, and trauma with ego-resilience is significantly negative. It is concluded that those individuals who were resilient they had less vulnerability of having depression, anxiety, and stress. The Hypothesis 1 that resiliency among individuals living in affected areas is inversely related with their levels of PTSD, depression, anxiety, and stress, is supported by these findings. There is much stronger inverse relationship of resiliency and levels of trauma, depression, anxiety and stress among the individuals living in unaffected areas. It shows that trauma, somehow, affects the resiliency of the individuals who undergone trauma.

Table 1  
*Relationship of Resiliency with Depression, Anxiety, Stress, and Trauma in Individuals Living in Affected and unaffected Areas (N = 600)*

Variables	Ego-resilience	
	Affected Area (n = 300)	Unaffected Area (n = 300)
Depression	-.24***	-.34***
Anxiety	-.39***	-.39***
Stress	-.26***	-.32***
Trauma	-.26***	-.45***

\*\*\* $p < .001$ .

Second hypothesis that levels of PTSD, depression, anxiety, and stress are higher in individuals living in affected areas as compared to individuals living in unaffected areas is supported by the results in Table 2. The two groups can be differentiated significantly on trauma as measured by IES. Individuals living in affected areas scored significantly high on Depression, Anxiety, and Stress subscales of DASS compared to those living in unaffected areas. Cohen's  $d$  values

show the effect size for Trauma, Depression, Anxiety, and Stress has bigger effect size. There is nonsignificant difference on resilience.

Table 2

*Comparison between Individuals Living in Affected and Unaffected Areas on Depression, Anxiety, Stress, Trauma, and Resilience (N = 600)*

Variables	Affected area (n = 300)	Unaffected area (n = 300)	t(598)	p	95% CI		Cohen's d
	M(SD)	M(SD)			LL	UL	
Trauma	35.2(9.7)	17.6(7.4)	24.7	.001	-9	3.2	2.03
Depression	17.8(7.9)	10.4(4.7)	13.9	.001	-1.8	3.7	1.14
Anxiety	16.6(6.4)	9.7(4.6)	14.9	.001	-1.3	2.3	1.24
Stress	19.6(7.4)	10.1(4.1)	19.6	.001	-1.9	3.3	1.60
Resilience	39.5(6.7)	41.5(5.2)	3.2	.12	-1.3	1.9	-0.33

Note. CI = Confidence Interval; LL = Lower Limit; UL = Upper Limit.

Table 3 shows that two groups, married and unmarried, differed significantly on subscale of Depression and Stress. The comparison of mean values indicates that married scored higher compared to unmarried group. Similarly, significant difference was seen in Trauma. Married individuals showed higher incidence of trauma as compared to unmarried group. Cohen's *d* indicates that Depression and Stress has higher effect size compare to Trauma and Resilience.

Table 3

*Comparison of Married and Unmarried Individuals Living in Affected Areas on Depression, Anxiety, Stress, Trauma, and Resilience*

Variables	Married Individuals (n = 195)	Unmarried Individuals (n = 105)	t(298)	p	95% CI		Cohen's d
	M(SD)	M(SD)			LL	UL	
Depression	20.4(5.8)	18.2(4.9)	7.2	.02	-1.3	2.8	0.41
Anxiety	17.4(5.9)	15.7(5.4)	5.9	.07	-1.6	3.3	0.30
Stress	18.6(6.5)	16.4(5.8)	6.5	.03	-1.1	4.2	0.35
Trauma	32.3(9.9)	29.8(8.7)	6.9	.04	-0.8	3.3	0.27
Resilience	23.9(6.4)	22.6(5.8)	1.7	.08	-0.9	3.4	0.21

Note. CI = Confidence Interval; LL = Lower Limit; UL = Upper Limit.

Table 4 shows that two groups, men and women, living in affected areas have significant difference on stress with women scoring high as compared to male participants. Results are nonsignificant on the variables of depression, anxiety, trauma, and resilience.

Table 4

*Comparison of Men and Women Living in Affected Areas on Depression, Anxiety, Stress, Trauma, and Resilience*

Variables	Men	Women	<i>t</i> (298)	<i>p</i>	95% CI		Cohen's <i>d</i>
	( <i>n</i> = 188)	( <i>n</i> = 112)			LL	UL	
Depression	<i>M</i> ( <i>SD</i> ) 19.3(5.8)	<i>M</i> ( <i>SD</i> ) 21.2(5.3)	2.2	.13	-1.6	1.8	-0.34
Anxiety	<i>M</i> ( <i>SD</i> ) 16.7(6.3)	<i>M</i> ( <i>SD</i> ) 16.1(7.1)	3.6	.10	-1.5	1.0	.089
Stress	<i>M</i> ( <i>SD</i> ) 17.6(6.5)	<i>M</i> ( <i>SD</i> ) 21.2(5.5)	7.5	.03	-0.5	1.2	-0.46
Trauma	<i>M</i> ( <i>SD</i> ) 29.7(7.9)	<i>M</i> ( <i>SD</i> ) 30.9(6.9)	4.9	.08	-1.5	1.3	-0.16
Resilience	<i>M</i> ( <i>SD</i> ) 21.7(4.5)	<i>M</i> ( <i>SD</i> ) 21.1(5.1)	1.4	.15	-1.8	2.4	0.10

*Note.* CI = Confidence Interval; LL = Lower Limit; UL = Upper Limit.

## Discussion

Findings of the present study support earlier findings that people exposed to a natural disaster may have PTSD, depression, anxiety, and stress even after years of its experience. Their psychological disorders may persist somewhat longer than it is usually thought to be the case. Past research has empirically validated disasters as risks for developing PTSD and distress (Galea et al., 2005). For example, this was seen in the survivors of the 1985 Erzincan earthquake in Turkey, the victims had more psychological problems like trauma, depression, and generalized anxiety disorders than to those who did not face the trauma (Karanci & Rustemli, 1995). Hull, Alexander, and Klein (2001) performed a unique long-term follow-up study of the survivors of a disaster and found that 21% of the survivors were still meeting the most stringent diagnostic criteria for PTSD over 10 years after the disaster. Shore, Tatum, and Vollmer (1986) reported an exposure-related onset of PTSD, generalized anxiety disorder, and depression after the 1980 Mount St. Helen's volcanic eruption. Duggan and Gunn (1995) reported on a group of adults exposed to disasters and found the responses ranged from adaptive restoration of functioning, normal stress response syndromes, resilient recovery, or serious and persisting psychological responses consistent with PTSD (Horowitz et al., 1991). In a longitudinal comparative study of physical and mental health problems of affected residents of the firework disaster Enschede, The Netherlands, Grievink et al. (2007) reported the similar findings. The results of these studies are consistent with our findings.

Another finding of the present study was that there were some individuals who were despite living in affected areas did not exhibit

psychopathology. This could be because of "resilience" as the variable of resiliency included in the study. It was stated that resilience is inversely related with the levels of PTSD, depression, anxiety, and stress. There is also strong negative relationship of resiliency and levels of trauma, depression, anxiety and stress among the individuals living in unaffected areas as compare to affected areas. It means that disasters affect the personality factor of resiliency of the individuals.

It demonstrates what relevant literature on resilience depicts it to be as a personality factor helping the possessor of the trait to rebound or spring back after being stressed and distressed and thus recover strength, spirit, and good humor. The findings of our study are in line with the previous studies. One of the resilient factors could be the "faith", as in a study, Niaz (2006) described that role of faith and resilience in recovery from traumatic events is a common observation. Victims of North West Frontier Province and Azad Jammu & Kashmir clearly demonstrated the positive effects of faith and resilience. Faith in God Almighty was a major factor in strengthening resilience and promoting recovery from trauma and other psychological complications.

Cairns (2006) observed that the features that associated with resilience relate to the strengths and positive aspects of an individual's mental state. Assessment of resilience in the victims of trauma is also crucial in determining the ways in which individuals react to and deal with stress. In patients with posttraumatic stress disorder, resilience can be used as a measure of treatment outcome. This is particularly important knowing that PTSD may lead to the breakdown of fundamental beliefs and assumptions about the world, such as the belief that the world is essentially just or benevolent, that people have control over their lives, or that bad things do not ultimately happen to good people.

Though, the present research provides empirical evidence to an otherwise well understood phenomenon, but it has important practical implications in a country where not many empirical studies have been done on traumatized or stressed persons exposed to natural disasters. The present study helps in raising awareness about the needs of traumatized persons who may continue having problems years after exposure to trauma. PTSD, depression, stress, and anxiety are debilitating disorders the studies like the present one may urge a society think of policies and plans and evolve strategies to beef up their mental health services. Scientific research like the present one is imperative for effective intervention and rehabilitative measures for individuals who are victims of disasters or have been traumatized as a result of grief, violence, or some kind of abuse. It has been shown that

women exposed to trauma are more likely to develop PTSD and psychological complaints than men (Punamaki, Komproe, Qouta, Elmasri, & Dejong, 2005). Though the women exposed to trauma develop more trauma and related symptoms than men, however, in China a study found nonsignificant difference in the two genders (Kun et al., 2009). The results of our study are consistent with the findings of Kun et al. that there is nonsignificant difference in two genders. The reason may be that in collectivistic cultures, both the genders share the almost equal responsibilities of life, so because of strong bindings among family members. So the sufferings due to any trauma are equally disturbing for both husband and wife (Kun et al., 2009).

### **Limitations and Suggestions**

Future research may be planned keeping in mind the limitations of the present study. Self-report instruments were used; hence, the response may have been over or under reported and the cultural sensitivity of psychological symptoms may have affected responses.

Epidemiological studies on the prevalence of stress and anxiety among different segments of both male and female populations should be carried out, so that a base-line normative data are available to the researchers, policy makers, and administrators of mental health services. Gender and age differences are important to study to establish the role of these demographics.

Another important point to note is that the findings of the present study are based on those who continued living in the earthquake affected areas and not on those, who moved out of the area after the earthquake. Furthermore, these are not based on any clinical diagnostic investigation and instead a self-report method was used which could yield higher rates of disorder than structured clinical interviews. Equally important could have been information on past psychiatric illness or disorders of the participants. The personality trait of resilience, post-disaster experiences, and the social support available are important factors to study as these may determine the nature and extent of their post disaster psychological disorders (Basoglu et al., 2002). Information on important trauma-exposure variables such as extent of damage or fear or perceived life-threat during a disaster, rubble experience, disability or injury, etc. and data on a host of important demographic variables such as past personal and family psychiatric illness would have been equally useful to identify fine differences in the ways individuals react to trauma experiences and cope with them (Basoglu et al., 2002; Carr et al.,

1997; Freedy et al., 1995; Lima, Chavez, & Samaniego, 1989; Yu, Yi, & Zhi, 2008). Early mental health intervention may serve to prevent the chronicity of posttraumatic stress reactions among earthquake victims (Abdurrahman, Ozenb, & Aytakin, 2005).

## Conclusion

The study findings indicated that the amount of psychological distress among earthquake survivors was high and there is an urgent need to deliver mental health care to disaster victims in local medical setting and to reduce negative health impacts of the earthquake. Adequate psychological counseling is needed for those who survived the tragedy. Prompt and effective post-disaster intervention could mitigate the impact of initial exposure to reduce the probability of PTSD and other psychological problems. On the basis of these results, improvements can be made to health care, implementation of education programs, and existing rural healthcare services should be used to provide treatment for the common psychiatric disorders.

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