

## **A CROSS-CULTURAL STUDY OF THE PSYCHOSOCIAL AND SPIRITUAL IMPACT OF NATURAL DISASTER**

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**ABSTRACT:** We report a cross-cultural comparison of coping with natural disaster involving two populations—survivors from the 1999 earthquake in Turkey and from the 1994 Northridge earthquake in California. The research project was explorative in design and included 222 people—123 individuals from Turkey and 99 from California. A main focus of the study was how age, gender, marital status, and cultural differences impact on levels of Post-traumatic Stress Disorder (PTSD). Concomitantly, the association of many other variables was explored including cultural education, presence and degree of loss, extent of damage to one's home, whether individuals did or did not receive assistance, etc., and how these impacted their coping. Statistical analysis revealed strong associations between PTSD and age for both studies. It was found that the highest level of PTSD in the California sample occurred among individuals at least 60 years old. In the Turkey sample, those in their fifties showed the highest level of PTSD. The article highlights similarities and differences between the post-earthquake coping responses in California and Turkey and concludes by discussing forms of assistance to earthquake victims.

**KEY WORDS:** posttraumatic stress syndrome; earthquake; Turkey; California.

Disasters, whether man-made or natural, occur each day affecting the lives of many people psychologically, physically, socially, and spir-

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itually. The impact that a disaster has on a specific community, whether it be an earthquake, tornado, flood or hurricane, may have acute or chronic effects on various individuals within their communities. The degree to which the disaster affects individuals may depend on variables such as age, gender, marital status, and education. Several coping mechanisms are utilized to deal with such traumatic experiences. The variables just listed may affect how one copes with disasters; however, if these events are not dealt with effectively, one may experience Post-Traumatic Stress Disorder (PTSD). According to Kowalski and Kalayjian (2001, p. 75), "A person, exposed to a traumatic event who persistently re-experiences the event, avoids stimuli associated with the trauma and evidences persistent symptoms of increased arousal is at risk for PTSD." This article presents a cross-cultural comparison between the psychosocial and spiritual impact of two natural disasters, in this case earthquakes—the 1994 Northridge earthquake in California and the 1999 Turkey earthquake.

On January 17, 1994, an earthquake with a magnitude of 6.8 shook the San Fernando Valley and Los Angeles Basin for fifteen seconds. The extent of damage was massive, not only physically affecting the surrounding area, but also adversely affecting the population, both psychologically and spiritually. The combined destruction included 57 fatalities and an incurred cost of approximately \$25.7 million for physical damages (Comerio, 1998).

On August 17, 1999, five years after the Northridge quake, an even more destructive earthquake of 7.4 on the Richter scale occurred in western Turkey, centering on Golchuk, Izmit, Adapazari, Yalova, and Kocaeli in the country's industrial heart, and within fifty miles of Istanbul. Istanbul suffered only minimal damage to buildings and property; nevertheless, the residents were traumatized. Like California's earthquake, the affected area of Turkey was physically devastated; however, the number of fatalities was significantly greater. Official estimates of the death toll began near 17,000 while unofficial estimates put the number between 45,000 and 50,000 (Kowalski & Kalayjian, 2001). The earthquake has been characterized as one of the half-dozen deadliest earthquakes of the century (Newsweek, 1999).

One factor that may influence the level of PTSD is gender. For example, one study found that women reported higher levels of PTSD following a major flood disaster in South Africa (Burger, Van Staden, & Nieuwoudt, 1989). Another study found that after the occurrence of a severe natural disaster, females experienced higher levels of PTSD (Steinglass & Gerrity, 1990). Furthermore, following the earthquake

in Armenia (1998), females were shown to display increased fears and post-traumatic difficulties (Pynoos, Goenjian, Tashjian, et al., 1998). In contrast to the previously listed research, there was no evidence of gender differences in the level of PTSD following the sinking of a ferry off Belgium in 1987 (Joseph, Yule, Williams, & Hodgkinson, 1994). According to Burger (1992) and Steinglass and Gerrity (1990), gender does not influence the level of PTSD following natural or technological disasters. Other research has also shown that males and females experience similar levels of PTSD following the traumatic events (Breslau, Davis, Andreski, & Peterson, 1991). Thus, existing studies provide conflicting evidence about sex differences and level of PTSD.

PTSD has also been linked to the age of a person in various studies. Like gender, conflicting research findings characterize this topic. For instance, Knight, Gatz, Heller, and Bengston (2000) examined the level of emotional response in adults (aged 30–102 years) following the Northridge Earthquake. The median age for the sample was 64 years. The respondents were divided into three age different categories: middle-aged adults (30–54 years old), young-old aged (55–75 years old), and old-old aged (76+ years old).

This research was an offshoot of a continued longitudinal study of pre-disaster depressed mood. It was found that older adults (76+) reacted better to the earthquake than younger adults; however, the research suggests that the difference in reactions may have been due to pre-disaster functioning (Knight, Gatz, Heller, & Bengston, 2000). Other studies have also shown that when comparing younger adults to older adults, the latter receive lower scores on emotional distress scales after disasters (Kato, Asuki, Miyake, Minakawa, & Nishiyama, 1996). However and contrary to the aforementioned research, Ticehurst, Webster, Carr, and Lewin (1996) reported that older adults fared worse than younger adults when tested for events-specific distress.

Another important variable that influences the level of PTSD is culture (Kalayjian, 1998). Recognizing the differences in the “universal and the culture-specific aspects of the PTSD experience . . . can help clinicians adjust their practices and procedures to accommodate to the shared and the unique aspects of the PTSD experience” (Marsella, Friedman, Gerrity, & Scurfield, 1996). While this is true, it is also important to note that there may be great difficulty associated with comparing cross-cultural experiences. According to Bowman (1997), cultural differences make it difficult to compare the effects of toxic

exposure; however, at times naturally occurring events make such comparisons feasible. Marsella et al. (1996) claimed that there is sparse information concerning disaster and cross-cultural matters, thus making it quite difficult to draw conclusions about the influence that cultural factors have on emotional reactions to disaster.

Kalayjian (1999) placed emphasis on the importance of assisting survivors in reaching a healthy resolution of trauma and integrating it into their psyche. Kalayjian stumbled on the hidden signs of intergenerational transmission of trauma while studying the impact of the devastating earthquake in Armenia in 1989. She found that some of the nightmares of the earthquake survivors were not of the earthquake itself, but of Turkish gendarmes whipping them through the deserts, as was experienced by their parents during the Ottoman Turkish Genocide of the Armenians in 1915 in Asia Minor (Kalayjian, Shahinian, Gergerian, & Saraydarian, 1996). There are several research findings supporting this kind of intergenerational transmission in other populations (Kupelian, Kalayjian, & Kassabian, 1998).

A review of research findings reveals many differences in the research conducted on the relationship between levels of PTSD and a variety of variables. This article focuses on differences in age, marital status, gender, and cultural differences. Concomitantly, this research reports on many other variables including education, whether an individual did or did not receive assistance, whether an individual experienced loss, the extent of damage to one's home, etc.

## METHOD

### Participants

#### *Study I: Northridge, California*

Ninety-nine individuals participated in this study. The survivors were selected from Northridge, the epicenter of the earthquake. The participants were fully aware of the purpose of the study, and they gave their consent to participate in it. Out of the 99 participants, 54% were males and 46% were females, ranging in age from 18 to over 60 years old, with 70% of the participants falling between their thirties and fifties. Eighty-eight percent of the individuals were Christian, and 86% were American, including Armenian, Latin, Irish, and Italian American. Fifty-one percent were married and 30% were single. Ninety-nine percent of the participants had received at least a high school education. Fifty-four percent of these people were full-time employees, and 24% were owners of small businesses.

### *Study II: Izmit, Golchuk, and Istanbul, Turkey*

One-hundred-and-twenty-three volunteers were selected from those who survived the earthquake in Turkey. They were fully aware of the nature of the research and consented to participate in it. The respondents' age ranged from 10 to 59 years, with the majority of them being in their thirties. Fifty-eight percent of the individuals were married, 48% were employed, and 41% were either teachers or students. Seventy-three percent of the participants had a high school education or higher. Furthermore, 84% of these individuals lived in tents, while 16% lived in houses following the destruction caused by the earthquake.

#### **Interview Instrument**

The interview instrument implemented in this study was the Reaction Index Scale (RIS) devised by Frederick (1986). Initially, this scale was presented in survey form; however, it has since been considerably revised and restructured by Kalayjian. Currently, the adult version (Form A) consists of a two-part questionnaire. The first section contains 20 questions that address symptoms of PTSD. The answers are scored on a 5-point scale ranging from, 0 = none of the time to 4 = most of the time. Some questions are reverse-scored to prevent any response bias by the participant. Raw scores amounting to less than 15 indicate doubtful levels of PTSD, scores from 15 to 29 point to mild levels of PTSD, scores from 30 to 44 imply moderate levels of the disorder, scores from 45 to 59 mean severe levels of PTSD, and scores exceeding 60 indicate very severe levels of the disorder. The second section of the questionnaire is made up of eight questions that are concerned with the onset and scope of the symptoms. In addition, these open-ended questions added by Kalayjian address whether or not help was received following the traumatic event, the extent of the respondent's exposure to the event, and the meaning he or she associates with the trauma.

Kalayjian utilized the RIS scale in a variety of post-disaster assessments including the Armenia, California, and Turkey earthquakes and the 1992 Hurricane Andrew in Southern Florida.

## **RESULTS**

### **Interview Responses for Study I: California**

Analysis revealed that on average, all age groups showed moderate levels of PTSD. The 60+ age group scored 43, which was the closest

to severe levels of PTSD. Those participants in their twenties were most likely to exhibit mild levels of PTSD (mean score of 30). Respondents in their thirties ( $M = 35.2$ ), forties ( $M = 35.5$ ), and fifties ( $M = 36.5$ ) all scored similarly. Analysis showed significant relationships between PTSD and marital status and age but not gender. For PTSD and marital status, single persons scored lowest ( $M = 30.5$ ), followed by those who were married ( $M = 34.4$ ), those that were divorced scored highest ( $M = 45.5$ ),  $F(2, 75) = 3.89, p < .05$ . Pertaining to PTSD and age, older adults scored higher indicating higher levels of PTSD; the younger adults scored lower indicating lower levels of PTSD,  $r(78) = .24, p < .05$ . There was no relationship between gender and PTSD, men ( $M = 34.4$ ) and women scored similarly ( $M = 37.0$ ),  $t(75) = 0.5, ns$ . For each analysis, sample sizes vary due to missing data.

In regards to caring behavior and effects of the trauma, frequencies revealed that 63% received professional assistance and 83% were affected negatively by the earthquake. In regards to observations of damage and coping, 65% experienced mild to moderate damage to their home, while 60% experienced moderate responses to the earthquake.

### Interview Responses for Study II: Turkey

Analysis revealed that all of the participants except those in their thirties and fifties experienced moderate levels of PTSD. While adolescents and individuals in their forties showed a moderate level ( $M = 45$  and  $44$ , respectively), those in their thirties ( $M = 48$ ) and fifties ( $M = 49$ ) showed the highest level of PTSD. Individuals in their twenties experienced the lowest levels of the disorder ( $M = 36$ ).

Analysis showed significant relationships between PTSD and number of children, living situation, experience of loss, education, and gender but not with age or marital status. Those participants that had higher numbers of children had higher levels of PTSD; those with less children had scored lower levels of PTSD,  $r(90) = .24, p < .05$ . Those that lived in a tent ( $M = 50.6$ ) exhibited higher levels of PTSD than those living in a house ( $M = 29.1$ ),  $t(72) = 5.2, p < .001$ . Those individuals reporting no loss ( $M = 41.0$ ) indicated less PTSD than did individuals reporting loss of family or relatives ( $M = 44.3$ ) and those that lost friends or neighbors ( $M = 51.5$ ),  $F(2, 88) = 3.4, p < .05$ . Those with elementary school education ( $M = 58.8$ ) scored highest on the PTSD scale, followed by the high school educated ( $M = 48.8$ ), and college educated ( $M = 32.7$ ),  $F(2, 81) = 31.0, p < .001$ .

Men ( $M = 32.8$ ) indicated less PTSD than did women ( $M = 47.5$ ),  $t(87) = 3.7$ ,  $p < .001$ . Age was unrelated to PTSD,  $r(90) = .11$ , *ns*. Those who reported being married ( $M = 41.4$ ) did not differ from those who were single ( $M = 46.3$ ),  $t(86) = 1.3$ , *ns*. For each analysis, sample sizes vary due to missing data.

## DISCUSSION

The demographic factors in both studies accounted for some of the differences in the severity of PTSD. Both the California and Turkey data showed that the older survivors had the highest levels of PTSD. There were strong correlations between PTSD and age in both California and Turkey, with the exception of survivors in their thirties from Turkey who scored 48 indicating severe levels of PTSD. It is interesting to note that overall, the mean scores were about 10 points higher in the survivors from Turkey. Perhaps the frequency of earthquakes in California would account for this discrepancy. Survivors from California reported having multiple experiences with earthquakes indicating a form of desensitization, together with better preparation and a better collective support as opposed to survivors from Turkey who reported having no previous exposure to earthquakes. In addition, survivors from Turkey were subjected to an aftershock as severe as an earthquake less than a month after the initial earthquake. Consequently, there was a one-month lag between the interviews in the two countries, making survivors in Turkey score higher.

The findings on PTSD and age in both California and Turkey are consistent with the findings by Knight, Gatz, Heller, and Bengston (2000), confirming that age and PTSD are directly proportional. In congruence with these findings, Goenjian, Najarian, Pynoos, Steinberg, Manoukian, Tavosian, and Fairbanks (1994) showed that the adult and elderly population they studied following the 1988 earthquake in Armenia also experienced severe levels of posttraumatic stress. In addition, research done by Kalayjian (1995) following the 1988 earthquake in Armenia indicated that older adults experienced severe levels of PTSD. Other research findings have indicated higher levels of PTSD with older adults, perhaps due to already existing developmental challenges facing this age group and less social support available to them. According to Figley (1983) families can be an important source of emotional and instrumental support to the primary victims of trauma.

Analysis showed a significant relationship between PTSD and marital status in the California group. Those who were married scored higher than those who were single. Those who were divorced scored the highest. As for Turkey, the scores were reversed in that single survivors scored higher than married survivors. Those participants that had higher numbers of children had higher levels of PTSD.

There was a statistical significant gender difference in PTSD scores in Turkey, but not in California. The higher PTSD scores of females in Turkey are congruent with the findings of Steinglass and Gerrity (1990) who reported that after the occurrence of a severe natural disaster, females experienced higher levels of PTSD. In addition, research done by Pynoos, Goenjian, Tashjian, et al. (1998) following the earthquake in Armenia indicated that females display higher levels of PTSD. Furthermore, a study conducted by Burger, Van Staden, and Nieuwoudt (1989) indicated that females reported higher levels of PTSD following a major flood disaster in South Africa. According to Kalayjian (1995), following the 1988 earthquake in Armenia, female survivors exhibited higher levels of PTSD, while male survivors increased their alcohol consumption.

In regards to marital status, survivors from California who were divorced scored highest on the PTSD scale. This research result is congruent with research findings by Fullerton et al. (in press) who pointed out that the spouse/significant other is likely to be an important part of the recovery environment and often provides social support following trauma.

As for coping skills, the survivors in California showed that their main coping mechanism was to speak to others (about 60%). They found that relating to others who had undergone the same experience helped them come to terms with the event and gradually move on with their lives. Knowing that they were not alone in their experiences also seemed to help them cope with their emotional distress. This finding is in agreement with Kalayjian's post-earthquake research findings in Armenia (Kalayjian, 1995). Similarly, Bowman asserts that "there is evidence of some amelioration of the effects of toxic exposure if the individuals perceive that they have social support from others" (Bowman, 1997, p. 81).

Survivors made various attempts to find meaning in the earthquake. Many individuals stated that the earthquake taught them the unimportance of material things, the power of God/nature, the importance of survival, and the importance of preparation. Among the pre-

viously listed meanings that people reported after the earthquake, it is important to focus on preparation. As stated in Kowalski and Kalayjian (2001) and Kalayjian (1995, 1998, 1999), preparedness is an important indicator of recovery for survivors as they move on with their lives after the traumatic event. It is important to take as many precautions as possible before having to face another disaster. Being prepared for disaster may significantly decrease levels of distress by empowering the survivors.

A large majority of the earthquake survivors in both locations received professional help. In order for mental health professionals to administer proper care to survivors of disaster, it is very important that they are able to recognize signs that may indicate whether the survivor is at risk for mental illness. According to Weaver (1995), there are many common warning signs of mental illness including: continued feelings of anxiety/despair, isolation from social activity and withdrawal from friends and family, personality changes, increased anger or aggression, extreme dependency, decrease in performance, physical ailments, etc. Almost everybody experiences some of these symptoms following disasters; however, they are felt at different levels of intensity. For mental health professionals, it is very important to observe closely for these symptoms and the extent to which they are interfering with the everyday functioning of the survivors. They should be able to assess the levels of distress among the survivors, and if they feel that a given survivor needs more than short-term care, they should recommend it.

There are several different negative emotional and spiritual responses to an earthquake among the surviving population. It is suggested that the sooner these individuals receive some form of assistance, the more positive the outcome will be. Within two months of the earthquake in Turkey, an American team of psychologists ventured to the devastated area in hopes of assisting and relieving the victims from the trauma that they experienced. A six-step Bio-Psychosocial and Spiritual Model was developed by Kalayjian (Kowalski & Kalayjian, 2001), and implemented by the American team of experts. According to Kowalski and Kalayjian, this six-step model, previously called the Mental Health Outreach Program (MHOP), was implemented successfully in Armenia, California, and Florida for the traumatized people in the tent camps. In addition, children and personnel in a number of schools in Istanbul benefited from the implementation of this model.

As previously stated, there are six steps in this Bio-Psychosocial and Spiritual Program and they are:

1. Assessment
2. Expression of Feelings
3. Empathy and Validation
4. Discovery of Positive Meaning
5. Information Dissemination
6. Diaphragmatic Breathing Exercises for Total Relaxation.

These different steps address the mind-body-spirit continuum and several aspects of the traumatic event by assessing, identifying, validating, empathizing, informing, engaging in a discussion of rediscovery of meaning, and providing physical relaxation (Kowalski & Kalayjian, 2001).

It should be noted that the survivors are not the only ones at risk for emotional distress since other individuals, especially mental health professionals working with the survivors are also at risk. An example of stress experienced by the professional is a value conflict with the survivor or the family with whom he or she works. In addition, in an attempt to help, the mental health professional may push herself to work too much but fail to address her own needs and emotional limitations (Weaver, 1995). Therefore, it is very important for the caregivers to work moderate hours and to take care of their own wellbeing.

Models such as the Bio-Psychosocial and Spiritual Program can be very helpful in the event of traumatic exposure. They can help prevent or ameliorate adverse effects of trauma at an early stage. This model was found extremely useful when used in post-terrorism psychosocial interventions in New York.

Thus, although not all survivors of traumatic events will experience a full-blown PTSD, it is helpful to provide supportive care to survivors immediately following a mass disaster to contain emotional distress. Further research is recommended in the area of how culture influences surviving communities to cope with the devastation of mass trauma. With greater knowledge of PTSD and the variables that influence it, especially across cultures, psychologists will be able to develop individual and unique treatments for various groups in need of them.

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