Long-term Psychological Consequences of the 1999 Kocaeli Earthquake

Thesis submitted to the

Institute of Social Sciences

in partial fulfillment of the requirements for the degree of

Master of Arts

in Psychology

by

Ebru Şalcıoğlu

Boğaziçi University

2002

This thesis, submitted by Ebru Şalcıoğlu to the Institute of Social Sciences of Boğaziçi University in partial fulfillment of the requirements of the Degree of Master of Arts in Psychology, is approved.
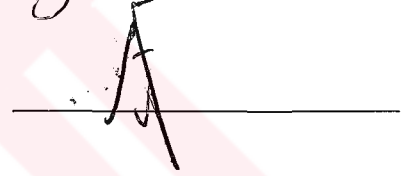
Thesis advisor: Dr. Nur Yeniçeri

Committee Member: Prof. Dr. Güler Okman Fişek

Committee Member: Prof. Dr. Falih Köksal

ACKNOWLEDGEMENTS

I would like to thank my advisor Dr. Nur Yeniçeri and committee members Prof. Dr. Güler Fişek and Prof. Dr. Falih Köksal for their guidance and support, not only in the process of writing up this thesis, but also throughout my studies at the Boğaziçi University.

My special thanks go to Yrd. Doç. Dr. Ali İ. Tekcan who has been very influential on my choice of pursuing an academic career.

I am grateful to Dr. Metin Başoğlu, my mentor, for showing me what academic life is about: commitment, hard work, sweat, and patience. I owe him special thanks for helping me in every way in this long process of becoming a good clinician and researcher, teaching me to think independently and giving me a 'world-view'. Invaluable are also the emotional support and encouragement he offered me when they were most needed.

I would like to thank Ms. Marianne Gerschel, and Dr. Leonard Lamm for their guidance, encouragement and support throughout my studies. '*I promise, I will be "myself".*'

Finally, I am grateful to my beloved parents, to whom I would like to dedicate my work, for their unconditional love and support, without which I could not have achieved this end.

ABSTRACT

Long-term Psychological Consequences of the 1999 Kocaeli Earthquake

by

Ebru Şalcıoğlu

The present study examined the rates of posttraumatic stress disorder (PTSD) and depression and associated risk factors in the 1999 Kocaeli earthquake survivors in Turkey. A group of 586 survivors from 3 prefabricated housing sites in the epicenter region was assessed using the "Screening Instrument for Traumatic Stress in Earthquake Survivors" and the "Fear and Avoidance Questionnaire." The estimated rates of PTSD and major depression were 39% and 18%, respectively. Traumatic stress symptoms related to more intense fear during the earthquake, female gender, older age, participation in rescue work, loss of friends and neigbours and past history of psychiatric illness. Depression related to death of a family member, being single, divorced or widowed, female gender and family history of psychiatric illness. Overall, survivors feared and avoided a mean of 10 earthquake-related situations. Phobic avoidance of buildings and related activities and more severe depressive symptoms related to more interference with social, occupational and family functioning. Subjective distress, disability in functioning, more severe depressive symptoms related to seeking psychological care. Finally, a factor analysis of the "Traumatic Stress Symptom Checklist" failed to replicate the DSM-IV PTSD symptom clusters. Overall, these results point to the need of implementing effective national mental health care policies for psychological care of survivors of earthquake. Furthermore, they suggest that possible differences in symptom profiles

following different traumatic events in different socio-cultural settings would need to be

taken into account in future revisions of the DSM-IV.

KISA ÖZET

1999 Kocaeli Depreminin Uzun Dönemde Psikolojik Etkileri

Ebru Şalcıoğlu

Bu çalışmada 1999 Kocaeli depremi mağdurlarında travma sonrası stres hastalığı (TSSH) ve depresyonun görülme sıklığı ile bu sorunların ortaya çıkmasına neden olabilecek risk faktörleri araştırılmıştır. Kocaeli'nde depremden sonra kurulan 3 prefabrik yerleşim merkezinde yaşayan 586 depremzede "Deprem Sonrası Travmatik Stres Tarama Ölçeği" ve "Korku ve Kaçınma Ölçeği" kullanılarak değerlendirilmişlerdir. TSSH ve depresyon sıklık oranları %39 ve %18 olarak belirlenmiştir. Travmatik stres belirtileri için risk faktörleri deprem sırasında duyulan korku, kadın cinsiyet, ilerlemiş yaş, kurtarma çalışmalarına katılma, arkadaş ve komşu kaybı ve geçmiş psikiyatrik hastalık öyküsü olarak belirlenmiştir. Depresyon içinse aileden can kaybı olması, bekar, boşanmış veya dul kalmış olmak, kadın cinsiyet ve ailede psikiyatrik öykü olması risk faktörleri olarak bulunmuştur. Depremzedelerin depremi hatırlatan ortalama 10 durumdan korktukları ve kaçındıkları gözlenmiştir. Binalardan ve binalarda gerçekleştirilen faaliyetlerden kaçınma ile ağır bir tabloda seyreden depresyon belirtilerinin sosyal, mesleki ve ailedeki işlevselliğin bozulması ile bağlantılı olduğu görülmüştür. Öznel sıkıntı, işlevsellikte bozulma, ve ağır bir tabloda seyreden depresyon belirtileri yardım arama davranışı ile ilişkilendirilmiştir. Son olarak, "Travmatik Stres Belirti Ölçeği" üzerinde yapılan bir faktör analizi DSM-IV'ün TSSH semptom kümelerini doğrulayamamıştır. Bu sonuçlar depremler sonrası uygulamaya konulacak etkili ulusal ruh sağlığı politikalarına ihtiyaç olduğunu göstermektedir. Bu sonuçlar ayrıca değişik kültürlerde, farklı travmatik olaylar

sonrası görülebilecek travmatik stres belirtilerindeki farklılıkların DSM'nin gelecekteki

revizyonlarında dikkate alınması gerektiğini göstermektedir.

TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

x

LIST OF APPENDICES

INTRODUCTION

Historical Development of the Concept of Posttraumatic Stress Disorder

Traumatic events such as natural disasters, wars, road accidents, or various forms of violence may adversely affect mental health functioning. Probably the most common psychiatric condition seen after such traumatic events is Posttraumatic Stress Disorder (PTSD). Although humanity had witnessed innumerable traumatic events throughout the centuries and survivors had suffered from the psychological consequences of such traumatic events, it was not until 1980 that the term PTSD was officially introduced into the psychiatric literature. The introduction of the new diagnosis of PTSD meant in a way the recognition of the psychological consequences of war, especially as experienced by Vietnam veterans (Gersons & Carlier, 1992). The diagnosis also officially recognized the psychological reactions of those people who had been in concentration camps.

The psychological effects of combat related events have long been recognized under various names, such as nervous shock, combat neurosis, war neurosis, irritable heart of the soldiers, traumatic neurosis and shell shock (Gersons & Carlier, 1992). These terms indicated a combination of symptoms which rendered the soldiers not suitable for military combat. Similar post-trauma reactions were also described in relation to other civilian traumatic events, such as rape (Burgess & Holmstrom, 1974) and natural disasters (Lifton & Olson, 1976). Although the DSM-I (1952) included psychological effects of traumatic events under the title of "traumatic neuroses", the DSM-II (1968) omitted such a disorder and classified post-trauma reactions as "situational disturbances" or "gross stress reactions". The literature on PTSD lacked a common language until its

introduction into the DSM-III (1980), when large numbers of Vietnam Veterans

presenting with a clear picture of the disorder returned home between 1968 and 1980.

Symptomatology: American Psychiatric Association (APA)

The DSM-III (APA, 1980) directly linked etiologically the symptoms of PTSD to

the experience of a psychologically traumatic event. However, it emphasized only the

objective qualities of the event. It defined an event traumatic only if it evoked significant

symptoms of distress in almost anyone. It grouped symptoms into three sections

(see Table 1): (1) re-experiencing of the traumatic event; (2) numbing of responsiveness

to or reduced involvement in the external world; and (3) a miscellaneous section that

included avoidance of trauma reminders, hyper-arousal, distress when reminded of the

trauma, guilt, and memory / concentration and sleep problems. This formulation of PTSD

was theoretical and it was not based on empirical evidence (Keane, 1993).

The DSM-III-R (APA, 1987), following research evidence in the field, introduced

some changes to the criteria for the diagnosis of PTSD. First of all, it modified the

definition of trauma, narrowing it to events that were outside the range of usual human

experience, and it brought time constraints on the development and duration of the

symptoms. It introduced 5 new symptoms (i.e. avoidance of thoughts or feelings

associated with the trauma, psychogenic amnesia, sense of a foreshortened future,

irritability, and physiological reactivity to trauma reminders) and omitted guilt from the

criteria. It again grouped symptoms into 3 sections with some slight changes in the

allocation of the symptoms to the existing clusters (see Table 2). For instance, it moved

distress upon reminders to the re-experiencing cluster, thus recognizing that

re-experiencing was often accompanied by strong emotional reactions. It also moved

avoidance of trauma reminders to the numbing cluster with avoidance of thought or

feeling associated with trauma, recognizing that avoidance reactions can take many forms

and represent a form of denial.

Table 1

DSM-III criteria for PTSD

1.	The existence of a recognizable stressor that would evoke significant symptoms of distress in almost anyone.
2.	Re-experiencing of the trauma as evidenced by at least one of the following (a) Recurrent and intrusive recollections of the event (b) Recurrent dreams of the event (c) Sudden acting or feeling as if the traumatic event were re-occurring, because of an association with an environmental or ideational stimulus
3.	Numbing of responsiveness to or reduced involvement in the external world, beginning some time after the trauma, as shown by at least one of the following: (a) Markedly diminished interest in one or more significant activities (b) Feeling of detachment or estrangement from others (c) Constricted affect
4.	At least two of the following symptoms that were not present before the trauma (a) Hyperalertness or an exaggerated startle response (b) Sleep disturbance (c) Guilt about surviving when others have not, or about behavior required for survival (d) Memory impairment or trouble concentrating (e) Avoidance of activities that arouse recollection of the traumatic event (f) Intensification of symptoms by exposure to events that symbolize or resemble the traumatic event

3

The DSM-IV (APA, 1994) slightly changed the diagnostic criteria for PTSD.

Whereas the former editions tried to define the traumatic event objectively. DSM-IV

emphasized the role of both the objective threat and the subjective appraisal of the event.

Table 2

DSM-III-R criteria for PTSD

A. The person has experienced an event that is outside of the range of human experience and that would be markedly distressing to almost anyone.

B. The traumatic event is persistently re-experienced in at least one of the following ways:
    (1) Recurrent and intrusive distressing recollections of the event
    (2) Recurrent distressing dreams of the event
    (3) Sudden acting or feeling as if the traumatic event were recurring
    (4) Intense psychological distress or exposure to events that symbolize or resemble an aspect of the traumatic event, including anniversaries of the trauma

C. Persistent avoidance of stimuli associated with the trauma or numbing of responsiveness (not present before trauma), as indicated by at least three of the following:
    (1) Efforts to avoid thoughts or feelings associated with the trauma
    (2) Efforts to avoid activities or situations that arouse recollections of the trauma
    (3) inability to recall an important aspect of the trauma (psychogenic amnesia)
    (4) Markedly diminished interest in significant activities
    (5) Feeling of detachment or estrangement from others
    (6) Restricted range of affect, e.g., unable to have loving feelings
    (7) Sense of a foreshortened future

D. Persistent symptoms of increased arousal (not present before the trauma), as indicated by at least two of the following:
    (1) Difficulty falling or staying asleep
    (2) Irritability or outbursts of anger
    (3) Difficulty concentrating
    (4) Hypervigilance
    (5) Exaggerated startle response
    (6) Physiological reactivity at exposure to events that symbolize or resemble an aspect of the traumatic event

E. Duration of the disturbance (symptoms in B, C, and D) of at least one month.

Table 3

DSM-IV Criteria for PTSD

A. The person has been exposed to a traumatic event in which both of the following were present:
1. the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self and others
2. the person's response involved intense fear, helplessness, or horror

B. The traumatic event is persistently re-experienced in one or more of the following ways:
1. recurrent and intrusive distressing recollections of the event, including images, thoughts or perceptions
2. recurrent distressing dreams of the event
3. acting or feeling as if the traumatic event were recurring (i.e; flashbacks)
4. intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event
5. physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event

C. Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness as indicated by three (or more) of the following:
1. Efforts to avoid thoughts, feelings, or conversations associated with the trauma
2. efforts to avoid activities, places, or people that arouse recollections of the trauma
3. inability to recall an important aspect of the trauma
4. markedly diminished interest or participation in significant activities
5. feeling of detachment or estrangement from others
6. restricted range of affect
7. sense of a foreshortened future

D. Persistent symptoms of increased arousal (not present before the trauma) as indicated by two (or more) of the following:
1. difficulty of falling or staying asleep
2. irritability or outbursts of anger
3. difficulty concentrating
4. hypervigilance
5. exaggerated startle response

E. Duration of the disturbance more than 1 month

F. The disturbance causes clinically significant distress or impairment in social, occupational or other important areas of functioning

5

It also introduced the requirement of clinically significant subjective distress and impairment in one of the life domains. These modifications were especially important as they served as the gatekeepers to the diagnosis of PTSD. The redefinition of the trauma and the severity of distress and disability caused by the symptoms rendered the diagnosis neither over-inclusive nor over-restrictive. DSM-IV also slightly changed the symptom criteria by moving "physiological reactivity when reminded of trauma" from cluster D to cluster B, recognizing it as a re-experiencing symptom.

Symptomatology: International Classification of Diseases (ICD)

Following the lead of the APA, the World Health Organization (WHO) also included the diagnosis of PTSD within the most recent edition of the International Classification of Diseases, ICD-10 (1993), within the category of "reaction to severe stress and adjustment disorders". As with the APA system, the experience of a traumatic event is seen to be the necessary etiological factor in the PTSD, but the approach to making the diagnosis is very different (see Table 4). Symptoms are seen to arise as a delayed and/or protracted response to a stressful event or situation that is exceptionally threatening or catastrophic and which is likely to cause pervasive distress in almost anyone. Repetitive re-experiencing of the trauma in memories, dreams, or daytime imagery should be present for diagnosis. Emotional detachment, numbing of feelings, and avoidance of trauma reminders are seen to be possible symptoms, but their presence is not essential for the diagnosis. Finally, arousal symptoms do contribute to the diagnosis but are not of prime importance.

Table 4

ICD-10 Criteria for PTSD

This disorder should not be diagnosed unless there is evidence that it arose within six months of a traumatic event of exceptional severity. A "probable" diagnosis might still be possible if delay between the event and the onset was longer than six months, provided that the clinical manifestations are typical and no alternative identification of the disorder (e.g., as an anxiety or obsessive-compulsive disorder or depressive disorder) is plausible. In addition to evidence of trauma, there must be a repetitive, intrusive recollection or re-enactment of the event in memories, daytime imagery, or dreams. Conspicuous emotional detachment, numbing of feeling, and avoidance of stimuli that might arouse recollection of the trauma are often present but are not essential for the diagnosis. The autonomic disturbances, mood disorder, and behavioral abnormalities all contribute to the diagnosis but are not of prime importance.

Problems with the DSM-IV PTSD Criteria

There are several problems with the DSM symptom criteria for PTSD. First of all, as stated previously, Vietnam veterans strongly advocated the introduction of posttraumatic stress problems in the DSM classification; therefore, studies of veterans formed the primary basis for PTSD symptom criteria when the disorder was included in the DSM-III (Keane, 1993). However, the configuration of symptoms used to diagnose PTSD in veterans may not fit survivors of non-combat traumatic events. McMillen (2000) argued that the PTSD of Vietnam combat veterans does not appear to be typical of most of the posttraumatic experiences observed in the community and suggested reassessment of the criteria used for intervention for broader use with other trauma populations. A second problem with the DSM approach to the diagnosis of PTSD comes from the fact that the symptom clusters represent hypothetical constructs; they are not gathered together following empirical evidence. Similarly, the number of symptoms necessary to meet the

diagnostic criteria for PTSD was chosen arbitrarily. As a result, a considerable number of trauma survivors fail to meet the number of symptoms required for the diagnosis. In fact, 45 out of 79 cases included in a study of survivors of the Sivas disaster in Turkey (i.e., a religious fundamentalist protest at a cultural festival which caused 37 deaths and more than 60 injuries) met the subthreshold criteria (i.e., fulfilling all except 1 symptom) at one of the 4 assessment points during the 18-month course (Sungur & Kaya, 2001). The authors argued that this remarkable number of subthreshold cases might easily be overlooked and consequently, might not receive necessary interventions although they may suffer more seriously than those with the full DSM's required list of symptoms of PTSD.

This controversy of excessive number of symptoms required to make the diagnosis of PTSD was in large part brought about from the current DSM-IV requirement of at least three out of seven Criterion C symptoms. Some concern has been expressed that this is excessive (Green, 1993; McMillen, 2000). It is argued that the requirement of three "C" symptoms may artificially reduce the number of people who receive the diagnosis. In fact, in many studies of crime and disaster survivors met symptom criterion C less frequently than symptom criteria B and D (Kilpatrick & Resnick, 1993; Foa, Riggs, & Gershuny, 1995, Solomon & Canino, 1990; Green, 1993; Norris, 1992). Most notable among these is a study of Hurricane Hugo survivors (Norris, 1992), where 83% of survivors met criterion B and 42% met criterion D, but only 6% met criterion C 1 to 2 months post-disaster (Norris, 1992). As a result, only 5% met criteria for PTSD. Similarly, changes in criterion C symptoms were central in explaining changes in PTSD diagnostic status in a longitudinal study of survivors of a mass shooting (North et al.,

1997). Change in acknowledgement of a single criterion C explained 5 of the 12 changes from PTSD negative index to PTSD positive at 1-year follow-up and 5 of the 16 changes from PTSD positive at index to PTSD negative at follow-up.

Why is criterion C more difficult to meet? There are several reasons for this. In the first place, it requires a higher number of symptoms (i.e., three) to be present than the other two symptom clusters. Second, some symptoms in this cluster, especially the numbing symptoms, are some of the least frequently reported symptoms of PTSD (Solomon & Canino, 1990; Green, 1993; Kilpatrick & Resnick, 1993). The low frequency of numbing symptoms can be explained first by the difficulty to operationalize them, which poses serious measurement problems. Secondly, numbing symptoms are not unique to PTSD and are found in other disorders, mainly in depression. On the basis of the latter argument it is possible to argue that numbing symptoms are misplaced. Indeed, several studies investigating the factorial structure of the PTSD symptoms have found strong support for a separate dimension for emotional numbing, sense of detachment, and loss of interest (Foa, Riggs, & Gershuny, 1995; Watson, Kucala, Juba, Anderson, &Anderson, 1991; Keane, 1993). These results suggest that the numbing symptoms should be treated differently from the symptoms of avoidance. Finally, cross-cultural differences may account for the low frequency of numbing symptoms. In societies where emotional sharing is promoted (i.e., more collectivistic societies) the avoidance of social relationships and emotional constriction are less likely to develop. Especially after large-scale disasters, the increased sense of communal identity may make the occurrence symptoms less likely.

Given the questions that have been raised about the applicability of symptom criteria C and the evidence that meeting the C criterion is central to the diagnosis of PTSD (McMillen, 2000) argument is made that only two symptoms be required to meet the C criterion of the diagnosis rather than the current requirement of three symptoms (Green, 1993). This would allow people who are primarily in an avoidant mode to meet the criteria (C1-C2) and as well as those who are primarily in a numbing mode (C3-C7). The more esoteric symptoms (amnesia, foreshortened future) would help catch cases that are not as clear-cut but would not be required for more routine and perhaps more mild cases (Green, 1993). So far, not enough evidence has accumulated to drop any of the symptoms.

Prevalence of PTSD in Exposed Populations

Research indicates that life-time prevalence of exposure to at least one traumatic event ranges between 43% and 81% for men, and between 37% and 74% for women (Breslau, Davis, Andreski, & Peterson, 1991; Breslau, Davis, & Peterson, 1997; Norris, 1992; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1992; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Any event involving life-threat can be so traumatizing that it would seem that anyone exposed to it would develop PTSD. However, there is tremendous variability in the reported rates of PTSD between studies of different traumatic events (Rubonis & Bickman, 1991). In an extensive review of the literature, Green (1994) concluded that, following exposure to a traumatic event, generally rates of PTSD average around 25% to 30%. Rates of PTSD were found to range from 2% to 39% among Vietnam veterans (Helzer, Robins, & McEvoy, 1987; Card, 1987; Snow et al.,

1988). In a multi-site study investigating the psychological effects of war and human rights violations in former Yugoslavia, the PTSD prevalence has been found to be 23% for combat veterans, 53% for torture survivors, 21% for refugees, and 9% for internally displaced survivors in Serbia (Başoğlu, Livanou, Crnobaric, Drakulic, & Dimic, submitted). PTSD rates among tortured political activists in Turkey were found to be 18% in Turkey (Başoğlu, Paker, Paker, Özmen, Marks, et al., 1994), and 31% in Germany (Maercker & Schutzwohl, 1997). More dramatic prevalence rates were reported in political- and non-political refugees, 79% and 90% respectively (Mollica, McInnes, Pham, Fawzi, Murphy, & Lin, 1998). Evidence suggests that rape produces higher rates of PTSD than those that are produced by other traumatic events. In fact, life-time prevalence of PTSD among sexual assault victims ranges between 28% and 76% (for a review see Joseph, Williams, & Yule, 1997). Finally, PTSD prevalence after various natural disasters were 3% following volcanic eruption, 15% following flood (Madakasira & O'Brien, 1987), and ranges from 21% to 59% in tornado victims (Steinglass & Gerrity, 1990; Madakasira & O'Brien, 1987). The variability of prevalence rates of PTSD after different traumatic events raises the question whether different events lead to different rates of disorder and different symptoms (Joseph et al., 1997).

Studies of Earthquakes

Research on the psychological effects of earthquakes revealed high rates of psychological problems both in the short and in the long-term. Exposure to earthquakes is associated with increased psychological distress (Karancı & Rüstemli, 1995; Lima, Chavez, Samaniego, Pompei, Pai, Santacruz, &Lozano, 1989; Papadatos, Nikou, &

Potamianos, 1990). In a controlled study of the long-term psychological effects of the 1992 Erzincan earthquake in Turkey, people who had experienced the earthquake had more psychological problems than did the controls (Karancı & Rüstemli, 1995). Lima et al (1989) reported that 40% of 150 patients attending primary health clinics 3 months after the 1987 Ecuador earthquake suffered from emotional distress, with "being easily frightened", "feeling nervous, tense, or worried", "feeling easily tired", and "sleeping badly" being the most prevalent symptoms.

The PTSD rates reported in previous studies of earthquake survivors ranged from 2% to 87% (Carr, Lewin, Webster, Hazell, Kenardy, & Carter, 1995; de la Fuente, 1990; Durkin, 1993; Goenjian, Najarian, Pynoos, Steinberg, Manoukian, Tavosian, & Fairbanks, 1994; Goenjian, Steinberg, Najarian, Fairbanks, Tashjian, & Pynoos, 2000; McMillen, North, & Smith, 2000; Sharan, Chaudhary, Kavathekar, & Saxena, 1996; Wang, Gao, Shinfuku, Zhang, Zhao, & Shen, 2000). Goenjian et al. (1994) reported a rate of PTSD of 67% in a sample of 60 1988 Armenian earthquake survivors (the study was conducted 18 months after the earthquake). A study of mental health problems ten weeks after the 1985 earthquakes in Mexico revealed a PTSD rate of 32% (De La Fuente, 1990). Similarly, 23% of the cases interviewed 1 month after the 1993 India earthquake had PTSD (Sharan et al., 1996). The prevalence of PTSD was 13% among the 130 Northridge, California earthquake survivors (McMillen et al., 2000). In a controlled study of the 1983 Coalinga and the 1985 Chile earthquakes the rate of PTSD was 3% and 19%, respectively (Durkin, 1993). The prevalence of PTSD in the Coalinga sample was similar to the non-exposed Los Angeles group (2.2%), however the Chile group exceeded the control group by approximately 9 times. The difference between the Coalinga and Chile

12

samples may be attributable to the differential consequences of the earthquakes. The Chile earthquake was bigger in magnitude and caused fatalities, whereas the Coalinga earthquake was smaller and did not cause fatalities. A comparable finding comes from a study after the 1989 Newcastle earthquake, where authors reported a PTSD rate of 18% among people exposed to high level of earthquake-related threat and disruption as opposed to 2% in the general Newcastle population (Carr et al., 1995).

Consistent with the literature, assessments made 4 to10 months after the 1999 earthquake in Turkey revealed that 43% of survivors living in survivor camps and prefabricated housing sites had PTSD (Başoğlu, Şalcıoğlu, & Livanou; in press), with no significant time effect. An epidemiological study after the same earthquake revealed 23% of PTSD (Başoğlu, Kılıç, Şalcıoğlu, & Livanou, submitted).

Few studies have examined the longitudinal course of PTSD in earthquake survivors. A prospective cohort study (Goenjian et al. 2000) that examined the rates of PTSD in a group of Armenian earthquake survivors with high trauma exposure 1.5 and 4.5 years after the disaster found rates of 87% and 73%, respectively. This study, however, was based on a relatively small convenience sample 78 earthquake survivors. Following the 1989 Newcastle earthquake, 48% of survivors who were exposed to threat and disruption and had PTSD at 6 months post-earthquake still had PTSD at 2-year assessment (Carr, Lewin, Webster, Kenardy, Hazell, & Carter, 1997). This study showed that earthquake-related morbidity declined over time and stabilized at about 18 months post-disaster. Finally, Wang et al. (2000) studied longitudinally the rates of PTSD after the 1998 North China earthquake in two villages and reported PTSD rates of 19% within 3 months and 24% within 9 months after the disaster.

In addition to these studies investigating PTSD prevalence in the long-term, there is also some evidence from other studies to suggest that earthquake-related psychological distress is persistent. In a cross-sectional study, Kato, Asukai, Miyake, Minakawa, & Nishiyama (1996) found no significant decrease in the percentage of subjects experiencing sleeping difficulty, depressive mood, exaggerated startle response, and irritability from 3 weeks to 2 months after 1995 Hanshin-Awaji earthquake. Similarly, levels of psychological distress were found to be higher even 7 years after the Naples earthquakes for those who reported damage due to the disasters (Bland, O'Leary, Farinaro, Jossa, Krogh, Violanti, & Trevisan, 1996). More studies are needed to understand the long-term course of PTSD and its symptomatology in survivors of large-scale earthquakes.

The wide range of PTSD in the studies conducted so far could be explained in part by the differences in their methodology. For instance, studies using symptom checklists have often yielded higher rates of psychopathology than those based on structured interviews (Steinglass & Gerrity, 1990). In addition, time since trauma may affect morbidity rates as symptoms may remit in time (Steinglass & Gerrity, 1990; Carr, Lewin, Webster, & Kenardy, 1997). Most studies were conducted with small samples, whose representativeness could be questioned. Finally, these earthquakes were widely variable in the extent of devastation and casualties they caused. Studies with better methodology have been conducted in countries such as the US or Australia, which have suffered smaller-scale devastations compared with the developing countries. Thus, perhaps with the exception of the 1988 Armenian earthquake, we know little about the psychological consequences of earthquakes in countries that are prone to large-scale destruction because

of their geographical location, poor structural quality of buildings, and unpreparedness for earthquakes. The need for more studies in these countries is evident considering that 91 of the 108 major earthquakes (with a death toll over 1000) in the 20th century occurred in developing countries, accounting for 83% of 1.8 million deaths worldwide (National Earthquake Information Center, 2000). Such studies are needed to propose mental health policies in countries like Turkey which are at high risk for such disasters.

Predictors of PTSD in Earthquake Survivors

The question of who develops disaster-related psychological problems is important for planning appropriate interventions (Bland et al., 1997; Lewin, Carr, & Webster, 1998; Rubonis & Bickman, 1991). Some studies investigated factors that predicted post-earthquake traumatic stress responses. Demographic and personal history variables that were found to relate to traumatic stress problems in earthquake survivors were female gender (Sharan et al, 1996; Carr et al., 1997; Başoğlu et al., in press), older age at trauma (Carr et al., 1997), low level of education (de la Fuente, 1990; Karanci & Rüstemli, 1995; Başoğlu et al., in press; Armenian, Morikawa, Melkonian, Hovanesian, Haroutunian et al., 2000), previous psychological problems (Nolen-Hoeksema & Morrow, 1991; Başoğlu et al., in press) and a ruminative style of responding to the symptoms (Nolen-Hoeksema & Morrow, 1991).

The effect of specific earthquake related factors were also investigated. Most attention was paid to the predictive power of the severity of a traumatic stressor (both objectively and subjectively appraised) on posttraumatic psychological morbidity. Many studies reported a positive relationship between post-earthquake psychological problems

15

and exposure to threat of injury or actual injury (Carr et al, 1995; Carr, Lewin, Webster et al, 1997; Carr, Lewin, Kenardy et al., 1997). Degree of exposure predicted the level of psychological morbidity 2 years after the 1989 Newcastle and 1.5 years after the 1988 Armenian earthquakes (Carr, Lewin, Kenardy et al., 1997; Goenjian et al. 1994). Again, high level of exposure, defined as "being in a geographic location within an area of maximal damage", was related to PTSD in a group of 154 survivors of the 1988 Armenian earthquake (Armenian et al., 2000). Subjective perception of threat reflected in greater fear during the earthquake predicted severity of traumatic stress reactions after 1999 earthquake in Turkey (Başoğlu et al., 2001). Being left under the rubble (Başoğlu et al., in press), and participation in post disaster rescue work (Başoğlu et al., in press) were also identified as independent predictors of PTSD in the same study. Finally, death of a family member under rubble positively correlated with PTSD after the Armenian earthquake (Goenjian et al., 1994).

Other earthquake related consequences that predicted traumatic stress problems were disruption in life (Bland et al, 1996; Carr, Lewin, Webster et al, 1997; Carr, Lewin, Kenardy et al, 1997; Goenjian et al, 2000), resource loss (Carr et al, 1995; Freedy, Shaw, Jarrell, & Masters, 1992; Freedy, Saladin, Kilpatrick, Resnick, & Saunders, 1994; Lima et al, 1989; Maj, Starace, Crepet, Lobrace, Veltro, DeMarco, & Kemali, 1989), financial loss (Bland et al, 1996; Armenian et al, 2000), disruption in social network (Bland et al, 1997), lack of governmental support (Wang et al, 2000), and avoidance as a coping strategy (Carr et al., 1995).

One needs to be cautious in interpreting the above-mentioned findings, as some of them are based on correlational analyses and causality cannot be inferred from such

analyses. Moreover, these findings are difficult to compare because of the differences in sampling, assessment methods, time since the earthquake, intensity of the earthquake, and the scale of devastation. Investigation of predictors of long-term psychological problems is crucial for the implementation of mental health policies that should be observed after such disasters. The question of who develops disaster-related psychological problems is especially important for planning appropriate interventions both in the short- and long-term after the disaster (Bland et al., 1997; Lewin et al., 1998; Rubonis & Bickman, 1991).

Prevalence of depression in earthquake survivors

Depression has been found to occur as commonly as PTSD in survivors of earthquake. The rate of depression was 21% in Indian earthquake survivors (Sharan et al., 1996), approximately 52% in Italian survivors (Maj et al., 1989), 18% in Chile and 15% in Coalinga survivors (Durkin, 1993). In a group of survivors exposed to severe earthquake trauma Goenjian et al (2000) reported 28% and 24% of depression, respectively 1.5 and 4.5 years after the disaster. Assessments made 4 to10 months after the 1999 earthquake in Turkey revealed that 33% of survivors living in survivor camps and prefabricated housing sites (Başoğlu, Şalcıoğlu, & Livanou; in press) and 14% who live in their houses had depression (Başoğlu et al., submitted).

Psychological Models for the Etiology of PTSD

A. The Conditioning Model

The conditioning model of PTSD is based on Mowrer's two-factor learning theory (1960). This model proposes that fear and avoidance are acquired through classical and

17

operant conditioning. Neutral stimuli present at the time of the trauma become conditioned and then they can evoke high levels of arousal. Moreover, they can be paired with other neutral cues, which then become conditioned to evoke anxiety responses. When the trauma survivor faces trauma reminders, he/she exhibits intense emotional or physiological responses. To deal with these intense reactions avoidance behavior develops, which helps decrease or ward off the discomfort brought on by the conditioned stimuli (Keane, Zimmering, & Caddell, 1985). Repeated exposure to anxiogenic stimuli via re-experiencing symptoms (e.g. nightmares, flashbacks, etc) does not result in extinction because of the short duration of exposure, which is usually interrupted when distress becomes high (e.g. the person wakes up when a nightmare becomes very distressing, or, when the intrusive thoughts about the trauma become very distressing s/he switches to thinking of something else) (Keane et al., 1985).

According to the conditioning model, re-experiencing symptoms are seen to result from extensive generalization of trauma stimuli. Avoidance symptoms develop to ward off anxiety associated with reminders of trauma. Psychogenic amnesia is seen as cognitive avoidance of anxiogenic stimuli. An alternative explanation is that psychogenic amnesia results from the discrepancy between the survivor's mood state during the trauma and that at the time of the recall; there is evidence that such discrepancy may interfere with recollection (Bower, 1981). Among combat veterans loss of interest and social withdrawal were said to result from a `contrast effect', in which war time events had been far more stimulating than mundane civilian activities (Keane et al, 1985). In all types of trauma, loss of interest and social avoidance could also be seen as secondary to fear and avoidance.

Finally, arousal symptoms are seen as conditioned anxiety reactions. For instance, startle and hypervigilance are seen as conditioned responses possibly related to unpredictable and/or uncontrollable traumas. Anger and irritability are thought to reduce trauma survivor's distress from re-experiencing of the trauma.

The conditioning theory explains many aspects of PTSD but not all (Marks, 1987; de Silva & Rachman, 1981). For example, it does not explain why not all trauma survivors develop PTSD or how traumatic stress can be acquired vicariously. Modern conditioning theories have tried to overcome shortcomings of earlier ones. These new theories (Rescorla, 1988) suggest that conditioning concerns the learning of relations among events; therefore the mere pairing of two events might be an insufficient descriptor of the conditioning process. Animals and people acquire information about which stimuli allow them to predict, expect, or prepare for a biologically significant event. Only those stimuli which provide reliable or non-redundant information elicit a conditioned response (Rescorla, 1988). Consequently, whether a stimulus will elicit traumatic stress reactions or not may depend on the information the person has about the traumatic stressor, and/or on how the person appraises the stimulus on each occasion. Reformulated conditioning theories are more successful in explaining PTSD by including concepts similar to those of meaning and cognitive appraisal in their formulations.

B. Cognitive Schemata Models

Horowitz (1986) suggested that PTSD results from a conflict between the need to assimilate threat-related information into cognitive schemata, which are mental structures that contain information about events and concepts, and the need to reduce arousal.

Assimilation of trauma related information requires exposure to trauma reminders; exposure, however, increases arousal to the extent that the person feels unable to tolerate it and thus interrupts it. The unassimilated threat-related information activates a "drive for completion or mastery" (Horowitz & Becker, 1971), and, as a consequence, the survivor resumes interrupted assimilation of information regarding the traumatic event through the involuntary re-experiencing. Horowitz's model is based on negative feedback, in other words by trying to reduce arousal the person inhibits assimilation, which in turn increases the drive for completion and tends to give rise to more re-experiencing (Horowitz, 1986).

Horowitz's model tries to account for core symptoms of PTSD and gives importance to the role played by previous experiences. However, there is little evidence for a "drive of completion", which it partly depends on.

McCann, Sakheim, & Abrahamson (1988) offered another schema model. According to this model people develop cognitive schemata relating to six fundamental human needs: safety, trust, power, esteem, intimacy and independence. One's compatible experiences are assimilated into these schemata. When the experiences are incompatible, then the existing schemata have to change or new schemata have to be developed in order to accommodate the new information. Traumatic events are followed by attempts of accommodation because threat-related information may challenge well-established schemata about one's self and view of the world. Accommodation is usually a painful process, often resulting in maladaptive schemata and beliefs that relate to PTSD. Unfortunately, McCann et al's model does not explain why the painful process of accommodation has to lead to PTSD and not depression or any other disorder.

C. Information Processing Models

Several cognitive theories suggest that PTSD reflects impaired processing of the traumatic event. Applying Lang's bio-informational model of fear, Foa and her colleagues (Foa & Kozak, 1986; Foa, Steketee, & Rothbaum, 1989) proposed a theory of PTSD which is based on the idea of the conditioned formation of a "fear network" in memory, caused by traumatization. This network involves (1) stimulus information about the traumatic event; (2) information about cognitive, behavioral and physiological reactions to the event; and (3) interoceptive information which links these stimulus and response elements. People with an extensive fear network are predicted to have a number of information processing biases such as an attentional hypervigilance towards trauma reminders and a probability over-estimation that traumatic events are going to happen. Activation of the fear network by trauma reminders causes intrusive re-experiencing of the trauma. Attempts to suppress such activation result in avoidance symptoms. According to this model, successful resolution of the trauma can only occur by integrating the information in the fear network with existing trauma structures. This can occur first through activation of the fear network (via exposure therapy to structure-relevant material) and then provision of information incompatible with them (via exposure therapy and/or cognitive restructuring).

This model assumes that PTSD is the result of impaired processing. However, it is possible that PTSD itself may be the cause of this impaired processing. Foa and her colleagues give no evidence for the direction of causality. The model also suffers from the exclusive concentration upon fear (Joseph, Williams, &Yule, 1997).

A similar view comes from Chemtob, Roitblat, Hamata, Carlson, and Twentyman (1988), who assume that the fear network is permanently activated causing the survivor to function in "survival mode" that has proved adaptive during the traumatic event. According to what the authors call the "cognitive action theory", information is transmitted by signals through networks of hierarchically arranged, interconnected "nodes". Activation of certain nodes potentiates other related node-clusters and inhibits unrelated node-clusters (e.g. activation of the `drinking' node, potentiates nodes related to raising a glass and opening the mouth but inhibits nodes related to chewing and using a fork). In people with PTSD the threat/arousal node is constantly potentiated, at least weakly. Such potentiation is believed to be brought on by the interpretation of ambiguous evidence as threatening. Activation of the threat/arousal node also potentiates threat expectancy (with thoughts, images and memories related to threat expectancy) and inhibits nodes that would relate to dealing adaptively with the given situation. A narrowing attentional focus on threat-related stimuli further reinforces the sense of danger (Chemtob et al, 1988).

Again, cognitive action theory assumes that PTSD is the result of problematic information processing, rather than cause of it. So far there is no empirical evidence to fully support either position.

Creamer, Burgess, & Pattison (1992) offered a model that represented a synthesis and reconceptualization of Horowitz's, Foa and her colleagues' (1989), and Chembtob et al.'s (1988) proposals. They suggested that the processing of the objective stimuli present at the time of trauma and the interpretation or meaning attached to the experience result in the formation of the traumatic memory network. The formation of this network is

influenced by the level of exposure to trauma and it predicts the level of intrusive thoughts. Intrusion precedes avoidance, which appears as a coping strategy in response to the discomfort caused by the intrusion stage. However, this coping strategy proves maladaptive in the long run, as it interferes with effective processing. For recovery to take place the memory network must be activated and modified (network resolution processing). The activation of the memory network will result in the exposure to trauma-related memories. If the exposure to intrusive recollections is long enough, effective processing will occur (i.e., the stimulus-response connections will be weakened and this will bring modification of the meaning associated with the trauma). Creamer et al. (1992) presented empirical data on 158 survivors of a multiple shooting in a city office block to support their model. The results showed that intrusion and avoidance mediated between trauma and symptom development. Intrusion was negatively related to subsequent symptom levels and the association between exposure to trauma and avoidance was mediated by intrusion.

In general, information processing models for PTSD lack an empirical basis, as research has not yet been able to explore fully the function and nature of information and emotional processing.

D. Appraisal and Attribution Models

Some theorists argued that whether traumatic events will lead to PTSD or not depend on the way they are appraised. Indeed, perceived severity and threat during trauma are stronger predictors of PTSD than are objective severity and threat (Başoğlu & Paker, 1995; Ehlers, Mayou, & Bryant, 1998; Başoğlu et al., in press). For example, a study of

23

rape victims (Kilpatrick et al; 1989) found that those victims who perceived the assault to be life-threatening were more likely to develop PTSD than those who did not have this perception.

Appraisal is also said to be important in recovery from PTSD (Lifton & Olson, 1976; Ursano, Kao, & Fullerton, 1992). Survivors' search for the causes of a disaster and why it happened to them, has led researchers to assume that assigning meaning to trauma may help resolve post-trauma guilt and anxiety (Lifton & Olson, 1976).

One aspect of appraisal that helps people understand some of the processes involved in adaptation is causal attribution (Joseph et al., 1997). People have a need to predict and control events, and people who are exposed to unpredictable and uncontrollable events are strongly motivated to explain why the event occurred. (Wong & Weiner, 1981). This has been found after physical illness (Watts, 1982 cited in Joseph et al., 1997), cancer (Taylor, 1983 cited in Joseph et al., 1997), and accidents (Dollinger, 1986 cited in Joseph et al., 1997). Causal attributions for stressful events can concern internal or external, specific or global, and stable or unstable factors (Abramson, Seligman, & Teasdale et al, 1978). Internal, global, and stable causal attributions were associated with learned helplessness and depression (Abramson et al, 1978). There is no clear evidence however why distorted causal attributions might lead to lead to PTSD.

E. Psychosocial-Cognitive Models

Janoff-Bulman (1992) suggested that people have basic assumptions concerning personal invulnerability, perception of the world as meaningful and comprehensible, and positive view of the self, which promote optimism and prevent anxiety and avoidance.

Trauma violates a person's basic assumptions and leads the survivor to confront mortality and danger. This sudden violation of basic assumptions brings about post-trauma distress in some victims of trauma, which often involves feeling unsafe (Resick & Schnicke, 1993; Herman, 1992; Shaw, 1987), overpowered or helpless (Lifton & Olson, 1976; Taylor, 1983), and mistrustful (Lifton & Olson, 1976; Başoğlu, Paker, Özmen, Taşdemir, Şahin, et al., 1996). The sudden realisation of personal vulnerability is said to trigger fear, anxiety, depression, increased arousal and a sense of foreshortened future. When trauma is caused by another human, the survivor also discovers a malevolent, unreliable world where others are not to be trusted. This discovery may produce anger, mistrust, social withdrawal and disillusionment with authority, which often appear in PTSD. Finally, as trauma is often incompatible with the `just world' belief that misfortune does not strike worthy and decent people, trauma survivors cease to see the world as a meaningful and orderly place.

According to Janoff-Bulman's model, fundamental assumptions that have been questioned are less likely to shatter. Some post-hoc evidence to support this comes from a study in which tortured and non-tortured political activists were compared with non-tortured and not politically involved controls (Basoglu et al, 1996). The tortured activists scored significantly higher on measures of anxiety and depression, but their scores were within the normal range. They also had significantly more current and lifetime PTSD, but no survivor had severe PTSD. Both activist groups differed from controls in having less belief in a "benevolent state". The authors suggested that such beliefs might have protected the torture survivors from the traumatic effects of torture (Başoğlu et al, 1996).

Additional support to Janoff-Bulman's position is offered by a study of rape victims where loss of a loved one prior to the rape predicted better post-rape adjustment (Burgess & Holmstrom, 1978). In addition, the fact that people over the age of 65 are less vulnerable to psychological trauma (Huerta & Horton, 1978) may be attributable to an increase in recognition of personal vulnerability as they get older (Janoff-Bulman, 1992).

Despite the above, the argument that 'questioned assumptions are less likely to shatter' seems implausible in the light of studies which showed that past trauma (Davidson & Fairbank, 1993) and past psychiatric history (Resnick et al, 1992; McFarlane, 1989) were risk factors for PTSD.

Janoff-Bulman's model does not adequately explain why shattered assumptions should relate more to PTSD than to depression or phobia or generalized anxiety. Nor is there any account of the mechanism by which the shattering of illusions leads to maladjustment.

F. Dual Representation Theory

Brewin et al (1996), tried to explain PTSD in terms of a dual representation theory that involved an attempt to synthesise Janoff-Bulman's social-cognitive theory and Foa and her colleagues' information processing model. They argued that there are two representations of a traumatic event in the memory: one is verbally accessible (VAM) which contains autobiographical memories; the other is situationally accessible (SAM) which contains physiological and motor aspects of the trauma. The traumatic event is followed by a period of emotional processing, in which representations of trauma events and associated feelings (predominantly fear and threat, secondarily guilt, remorse anger)

enter the memory and then are manipulated by the survivor. This process involves activation of SAMs (intrusive memories and flashbacks) and VAMs that are manipulated by the survivor to control negative feelings. PTSD occurs when integration of trauma related-information and pre-existing cognitive schemata has been impossible due to the severity of the trauma or because the survivor was unable to process traumatic memories effectively. In such cases, the trauma may continue being processed chronically, and the person may continue being preoccupied with thoughts about the trauma and intrusions. The enhanced accessibility of VAMs and SAMs, and their associated emotional reactions are said to lead to the arousal symptoms of PTSD (Brewin et al, 1996).

A question that arises from the dual representation theory concerns the usefulness and the validity of a distinction between SAMs and VAMs. There is no empirical evidence so far to support such a distinction. The model does not explain why physiological and motor aspects of the trauma should be independent from autobiographical memories.

G. Mental Defeat

Steil and Ehlers (1995, 2000) argued that the negative idiosyncratic interpretation of intrusive memories of the traumatic event and cognitive strategies intended to control the intrusions play a major role in maintaining PTSD. According to this view the trauma survivor interprets the occurrence and/or content of the intrusive recollection as indicating the possibility of something unacceptable about self, an ongoing threat that the world presents to the self, and a permanent damage done to self or to survivor's world. These

negative interpretations then lead to a sense of ongoing threat (i.e., anticipation of future negative events) and loss of a positive perspective for the future. Evidence for this position comes from two studies of 159 and 138 motor vehicle accident survivors (Steil & Ehlers, 2000). In both studies the negative idiosyncratic meaning of intrusive recollections and avoidance as a coping strategy showed highly significant correlations with PTSD severity. Ehlers and Clark (2000) proposed that persistent PTSD occurs when individuals process the trauma events and/or their consequences in a way that produces a sense of a serious current threat. The sense of current threat is mediated by (a) individual differences in the appraisal of the trauma and/or its consequences and (b) individual differences in the nature of the memory for the event and its link to other autobiographical memories. These two processes are themselves influenced by the type of processing during the traumatic event. One particular example of the cognitive processes that affect subsequent appraisal is "mental defeat", in other words "the perceived loss of all psychological autonomy, accompanied by the sense of not being human anymore" (Ehlers and Clark, 2000, pp. 12). There is some evidence from work with trauma survivors that mental defeat correlates with chronic PTSD and it is a predictor poor response to exposure treatment (Ehlers, Maercker, & Boos, 2000; Ehlers, Clark, Dunmore, Jaycox, Meadows, & Foa, 1998).

H. An Integrative Psychosocial Model

On the basis of available models and evidence, Joseph et al (1997) proposed an integrative cognitive behavioral adaptation to traumatic stress problems, which attempts to account for the full range of post-trauma reactions. They argued that both conscious

28

and nonconscious processes are involved in the development of PTSD. They suggest that the traumatic event, perceived at the time of the trauma, evokes extreme emotional distress which interferes with its immediate processing. Representations of the "trauma related event stimuli" are held in memory due to their personal salience and to the difficulty in assimilation with other stored representations. These event cognitions provide the basis for intrusive ideation, which reflects the survivor's personality and/or representations of prior experiences. These images then lead to another cognitive activity to form the survivor's appraisals and reappraisals about the trauma. These involve meaning attributions to the trauma and draw more extensively and consciously upon past representations of personality and/or prior experience. The occurrence of event cognitions and appraisals are associated with strong emotional states (e.g., fear, panic, guilt, shame, grief, etc), which will themselves become the subjects of cognitive appraisal, influenced by personality. All this cognitive process provokes distress and attempts at coping, including avoidance of thoughts, emotions, and behaviors. An important component of coping is also seeking social support from the environment. In this model individual variation is attributable to a complex interaction between components which may bring about different outcomes at different points in time.

By addressing certain idiosyncratic aspects (such as personality and past experience) Joseph et al.'s model may explain why different people respond to severe trauma in different ways, or why some people develop PTSD after exposure to a certain traumatic event, but not after exposure to another. This model's limitation lies in the question of the validity of the distinction between memories that are not available to

conscious inspection and memories that can be deliberately retrieved. More research is needed to support this distinction.

Concluding remarks on the theories of PTSD

Trauma theorists have proposed so far various models that attempt to explain traumatic stress reactions, with a focus shifting more and more to the role of cognitive factors. However, many of these models have limitations. First of all, most of these models lack an empirical basis. Some of them cannot account for why some survivors develop PTSD and others don't (e.g., conditioning models), and most of them cannot explain why traumatic events lead to PTSD and not to other anxiety disorders or depression. More empirical evidence is needed to understand causes underlying the development and maintenance of PTSD.

AIMS AND HYPOTHESES

Background

On August 17, 1999 an earthquake of magnitude 7.4 on the Richter scale occurred on the North Anatolian Fault Zone with a macroseismic epicenter near the town of Gölcük in the western part of Turkey. The earthquake was felt in the entire region of Marmara but caused devastation mainly in several towns such as Kocaeli, Yalova, and Adapazarı. Over 130,000 houses were reduced to rubble or severely damaged and 17,127 people died (Government Crisis Center, Press Release, October 19, 1999). According to a Government Crisis Center report (September 7, 1999), 24,000 people were injured. The epicenter was in Gölcük, a town of 130,000 in Kocaeli about 100 km from Istanbul. About 24,000 houses were destroyed in Gölcük (Mayoral Office of Kocaeli, May 23, 2000a), with a death toll of over 5,000 (Mayoral Office of Kocaeli, May 23, 2000b).

On the 12th of November, 1999 a second earthquake (7.2 on the Richter scale) took place in Düzce (a town about 100 kilometers southeast of Gölcük), causing an additional death toll of 832. In this earthquake about 4950 people were injured and 13,000 buildings were either reduced to rubble or severely damaged (Government Crisis Management Center, Press Release, December 22, 1999). These two earthquakes were followed by hundreds of after-shocks. The psychological impact of these earthquakes was further aggravated by predictions of yet another major earthquake in the next 30 years, the epicenter of which is expected to be much nearer to Istanbul.

Setting

The present report is based on an ongoing project (*Development of a treatment programme for survivors of earthquake in Turkey*) designed to provide psychological

31

help for the August 1999 earthquake survivors in Turkey. This project is conducted by the

Istanbul Center for Behavior Research and Therapy (ICBRT), a site of international

project activities of the Section of Trauma Studies at the Institute of Psychiatry, King's

College London. The ICBRT was founded in 1995 by Metin Başoğlu, M.D., Ph.D, Head

of the Section of Trauma Studies. The ICBRT's research activities involve assessment

and treatment of survivors of various types of psychological trauma, including war and

political violence. Since the August 1999 Kocaeli earthquake, its activities have focused

on the assessment and treatment of earthquake-related psychological problems. The

current aims of the ICBRT include:

- The development of brief and effective psychological treatments for earthquake
  survivors

- The development of a self-help model of psychological care

- The development of an outreach treatment delivery model

- The development of cost-effective methods of dissemination of treatment

- Dissemination of knowledge through publications, conferences, training courses,
  etc.

- Provision of expertise for organizations concerned with care of earthquake
  survivors

The present report is based on a group of 586 non-treatment seeking earthquake

survivors living in prefabricated camps at a mean of 20 months after the disaster.

Survivors were screened with the "Screening Instrument for Traumatic Stress in

Earthquake Survivors" and "Fear and Avoidance Questionnaire". Screening of the

survivors was conducted as part of an outreach program, which aimed to determine those

survivors that needed psychological care for their posttraumatic stress problems and depression. Those who needed treatment were referred to Cognitive Behavioral Treatment, a routine clinical service provided by the project staff.

Aims of the Study

The aims of the present study can be stated as follows:

    a)   To report the rates of PTSD and depression 1 to 2 years post-disaster in affected communities in the epicenter region,

    b)   To report the incidence of PTSD and depression symptoms,

    c)   To examine predictors of post earthquake psychological morbidity,

    d)   To examine the factorial structure of TSSC symptoms,

    e)   To report the profile of phobic avoidance of trauma reminders in earthquake survivors,

    f)   To examine the prevalence of social disability and its relation to PTSD and depression symptoms, and phobic fears,

    g)   To determine the predictors of help-seeking behavior.

Hypotheses

    1.   Earthquake survivors will show elevated rates of PTSD and major depression at a mean of 20 months after the disaster.

    2.   PTSD and depression will relate to different risk factors.

    3.   Examination of the factorial structure of PTSD symptoms will fail to replicate the DSM-IV clusters.

    4.   Social disability will relate to more phobic avoidance of earthquake reminders.

    5.   Help seeking behavior will relate to illness severity and subjective distress.

METHOD

Participants

After the earthquake 19 survivor camps were set up in Gölcük to provide shelter

for about 10,000 adults (Government Crisis Center, Press Release, October 19, 1999).

From March 2000 onwards the survivors were relocated to the 20 prefabricated housing

sites that accommodated 16,000 people. The study group (n=586) was obtained from

three prefabricated house establishments set up by a foundation attached to Middle East

Technical University (METU) in Ankara. Site I was in Değirmendere and it

accommodated 172 survivors. Site II and III were in Izmit (city center) and they provided

shelter for 320 and 350 adults, respectively. In each site, respectively 158 (92%), 155

(48%), and 273 (78%) of the people were screened. The screening was conducted

between October 2000 and November 2001, approximately one to two years after the

earthquake (mean=605 days, range 414-829). Overall, the study took about 13 months to

complete. Four psychologists and four psychology students collected the data.

Procedure

Random sampling was not attempted because screening was conducted to

determine survivors in need of treatment. In each camp the prefabricated houses were

allocated to project workers who visited them consecutively and, if they could not find

anyone in a particular house, moved on to the next one. In subsequent days, they made

further attempts to find those who could not be contacted in the previous rounds.

Working families predominated among those they failed to contact because they were at

work when the staff worked during the day. These sites were meant only for homeless

survivors; however, some people with undamaged or minimally damaged houses (12%) also gained access to these shelters either because they were too frightened to go back to their homes as they did not trust the expert estimation of damage or it was economically convenient for them to stay in a prefabricated establishment as they did not pay rent. The latter group could constitute only a small portion because the management of the camps screened applicants thoroughly before admitting them to the camps.

As the screening was conducted as part of clinical service no inclusion criteria were employed, except for a minimum age limit of 15. Only survivors who had observable mental (e.g. psychosis), neurological (e.g., dementia), or physical illness that would impede their understanding of the questionnaires were not assessed. For illiterate survivors (4%) the scale items were read out and the responses were noted. The purpose of the screening was explained to the survivors and verbal consent was obtained. Very few survivors (about 2%) refused to fill in the screening form. Those who needed treatment were given Cognitive Behavioral Treatment (CBT) or medication (i.e., antidepressants) when need was indicated by psychiatric evaluation.

Measures

Two measures were used during the screening process: The *Screening Instrument for Traumatic Stress in Earthquake Survivors (SITSES)* (Başoğlu, Şalcıoğlu, Livanou, Özeren, Aker, Kılıç, Mestçioğlu, 2001) (see Appendix A) and the *Fear and Avoidance Questionnaire (FAQ)* (see Appendix B) (unpublished).

The SITSES was developed specifically to fill the need for a brief self-report instrument that would help provide a reliable diagnosis of PTSD and depression, and

35

would suggest severity of the symptoms. This instrument consisted of three parts:

(1) *Survivor Information Form (SIF)*: 28 items concerning demographics, personal and family history, trauma characteristics, and intensity of fear during the earthquake (0 = None, 1 = Mild, 2 = Somewhat severe, 3 = Severe, 4 = Extremely severe),

(2) *Traumatic Stress Symptom Checklist (TSSC)*: 17 DSM-IV PTSD and six depression symptoms in the last week, all measured on an intensity scale (0 = Not at all bothered-3 = Very much bothered). TSSC has an overall correct classification rate was 81% for PTSD and 77% for depression,

(3) *Severity of Disability Scale (SDS)*: three items measuring the global severity of subjective distress because of PTSD and depression symptoms (0 = Not distressed at all - 3 = Extremely distressed), the degree of disability in work, family, and social functioning (0=Not at all impaired-3 = Extremely impaired), and request for help from a doctor or psychologist (0 = No, 1 = Yes, 2 = Not sure).

The TSSC was validated on 130 earthquake survivors in Turkey (Başoğlu et al., 2001), using the Clinician-Administered PTSD Scale (CAPS) (Blake et al., 1990) and the Major Depressive Episode (MDE) module of the Structured Interview for DSM-IV (SCID) (First, Gibbon, Spitzer, & Williams, 1996) for comparison. When symptom presence was determined by an item score of 2 or higher, the items showed optimal sensitivity and specificity. When the diagnosis of PTSD was based on a cutoff point of 25 in the total scores of the 17 PTSD items, the scale showed sensitivity of .81 and specificity of .81. The overall correct classification rate was 81%. Similarly, a diagnosis of MDE based on a cutoff point of 38 in the total scores of the 23 TSSC items yielded sensitivity of .83 and specificity of .73. The overall correct classification rate was 77%.

36

The same cutoff points were used to predict the symptom presence, and the diagnoses of PTSD and MDE in the present study. As the diagnosis of a psychiatric condition cannot be established using a self-rated scale, the rates of PTSD and MDE reported in this study reflect the predicted rates of these conditions.

The FAQ was devised for the purposes of the project and included 35 activities or trauma reminders, each self-rated for the intensity of associated fear and avoidance (0=no fear/avoidance, 3=extreme fear/avoidance). The items were selected among the most feared and avoided activities and situations that patients reported during the clinical interviews. An effort was made to phrase the items in the simplest way possible to make them understandable to survivors of lower educational background. A four point scale was chosen for the items because our previous experience suggested that this afforded the opportunity to rate the intensity of the fear associated with a given activity and the consequent difficulty while at the same time keeping the scale simple enough to be understood by survivors of lower educational background. The anchor point of "moderate fear and avoidance" was not included to avoid central tendency in the rating of symptoms. The scale thus forced a choice between "slight fear and avoidance" and "fair fear and avoidance". The psychometric properties of the FAQ will be reported in the Results section. FAQ data were available for 556 cases.

RESULTS

Sample characteristics

The sample characteristics are presented in Table 5. The mean age of the study

participants was 38 ($\underline{SD}$ = 14.6). Women (57.5%) slightly outnumbered men (42.5%)

because men were at work when the data were collected during the day. More than a half

(67%) of the survivors was married. Fifty-six (10%) survivors reported past psychiatric

illness and 39 (7%) psychiatric illness in the family. One hundred and sixteen (20%) of

the survivors had previous trauma experience, which mainly included traffic accidents

(48%), fires (20%), and earthquakes (10%).

The study group included survivors with high trauma exposure. More than 90% of

the survivors were in a building during the earthquake, because the disaster had occurred

at 3:00 a.m. In 31% of the cases the house collapsed and, in a further 56%, it sustained

'moderate' to 'severe' damage (according to local government expert reports made

available to the survivors). Moderate to severe damage meant structural problems (e.g.

cracks in supporting columns or partial collapse of the building), which rendered the

house uninhabitable. Thus, 87% of the cases were left homeless after the earthquake.

Fifty-six of the survivors (10%) were trapped under rubble, 74 (13%) lost family

member(s), 212 (37%) second-degree relatives, 479 (82%) friends and/or neighbors, 392

(67%) property, and 199 (34%) had participated in rescue work.

To examine how the two genders differed from each other chi-square tests (for

categorical variables) and independent samples t-tests (for continuous variables) were

carried out on all demographic, personal history and trauma characteristics. Results are

shown in Table 5. Compared to men, women had significantly lower education, more

Table 5

Sample characteristics

	Total (n=586)			Males (n=249)			Females (n=337)			df	χ^2	t	p
	M	(SD)	%	M	(SD)	%	M	(SD)	%				
Demographic characteristics													
Age	38.1	14.6		38.5	15.43		37.7	13.99		1,501		.62	ns
Education[1]	4.1	1.23		4.4	1.09		3.8	1.28		1,565		5.78	.001
Marital status (married)			67			69			66	1	.46		ns
Personal history													
Past psychiatric illness			10			6			13	1	6.68		.01
Psychiatric illness in family			7			4			9	1	4.22		.05
Previous trauma experience			20			23			18	1	2.38		ns
Trauma characteristics													
Trapped under rubble			10			9			10	1	.15		ns
Lost family members			13			11			14	1	.98		ns
Lost second degree relatives			37			31			41	1	5.81		.01
Lost friends and / or neighbors			82			81			83	1	.22		ns
Lost property			67			69			66	1	.60		ns
Participated in rescue work			34			53			20	1	71.06		.001

[1] 1 = no schooling / illiterate, 2 = no schooling / literate, 3 = primary school, 4 = secondary school, 5 = high school, 6 = university / post-graduate studies

39

Table 5 Continued

	Total (n=586)			Males (n=249)			Females (n=337)			df	X²	t	p
	M	(SD)	%	M	(SD)	%	M	(SD)	%				
Current status of home [2]	3.8	1.09		3.7	1.13		3.9	1.06		1,573		-1.53	ns
Time since the earthquake (days)	605	114.2		608	116.76		603	112.4		1,583		.49	ns
Intensity of fear during the earthquake (0-4)	3	1.22		2.8	1.29		3.2	1.13		1,489		-4.08	.001
Prevalence of PTSD and MDE													
PTSD			40			28			49	1	25.05		.001
MDE			28			21			33	1	10.49		.001

---

[2] 1 = no damage, 2 = minimal damage, 3 = moderate damage, 4 = severe damage, 5 = reduced to rubble

40

personal and family history of psychiatric illness, lost more second-degree relatives, participated less in rescue work, and had greater fear during the earthquake.

To determine differences between three prefabricated housing establishments between sites comparisons were explored through chi-square tests (for categorical variables) and a one-way analysis of variance test with Bonferroni correction for multiple comparisons (for continuous variables) including all demographic, personal history and trauma characteristics. The results are presented in Table 6. Significant differences were found on age, education, past psychiatric history, previous trauma experience, rubble experience, loss of second degree relatives, property loss, current status of house, fear during earthquake and time since earthquake variables. Site I was younger, less educated, and had less fear during the earthquake than Site III. Site II reported significantly more family history of psychiatric illness, previous traumatic event, rubble experience, loss of second degree relatives, damage to the house and property loss than the other sites. Overall, this pattern of results suggested that Site II was likely to be more traumatized than the other sites.

Prevalence of PTSD and major depression

The estimated rates of PTSD and MDE were 40% and 28%, respectively. These rates are slightly lower than the previously mentioned figures (i.e., 43% and 31%) at an average of 10 months after the earthquake (Başoğlu et al., 2002).

Women had significantly higher estimated rates of PTSD, 49% vs 28% [χ^2 (1, $\underline{N}$=586)= 25.05, $\underline{p}$ < .001], and MDE, 33% vs 21% [χ^2 (1, $\underline{N}$=586) = 10.49, $\underline{p}$ < .001], than did men. Taking into account the fact that 58% of the respondents were women, the

41

adjusted rates for PTSD and MDE were 38.5% and 27%, respectively. As the study group included more than one person from the households that were screened, familial factors might have led to an over-estimation of PTSD and MDE. When the analyses included only one randomly selected person from each household (n = 308), the rates of PTSD and MDE slightly increased to 42.5% and 30%, respectively.

The rates of PTSD and MDE in Site I were lower than those in Site II and Site III (30% vs 43% and 45%for PTSD and 22% vs 28% and 31% for MDE). These differences were significant for PTSD [X^2 (2, N=586)=9.841, p<.01] but not for depression X^2 (2, N=586)= 4.628, p=.099)].

The 13-month duration of the study might have led to an over-estimation of symptom rates if the latter declined over time. To examine a possible time effect on the psychiatric morbidity rates, the study period (415 days) was divided into three time periods (138, 138, 139 days), with respectively 172, 150, and 264 survivors screened during each period. These periods corresponded to approximately 18, 23, 28 months after the earthquake, respectively. The estimated rates of PTSD across the periods were 31%, 43%, and 44%, the corresponding figures for depression were 21%, 27%, 32%, respectively. The sub-groups were then compared on the estimated rates of PTSD and MDE, using chi-square tests. The differences were significant [χ^2 (2, N = 586) = 7.699, p < .05. for PTSD; χ^2 (2, N = 586) = 6.619, p<.05]. The morbidity rates thus showed an increase rather than a decline over time. However, this result may be due to sampling bias arising from the unequal distribution of traumatic experiences over the sites. In fact 92% of the Period 1 survivors were from Site I, 94% of the Period 2 survivors were from Site II and all of Period 3 survivors were from Site III. As previously stated, Site II, which was

42

Table 6

Between sites comparisons on demographic, personal history and trauma characteristics

	Site I (n=158)			Site II (n=155)			Site III (n=273)			df	χ^2	F	p
	M	SD	%	M	SD	%	M	SD	%				
Demographic Characteristics													
Age	35.5	12.91		38.6	13.88		39.3	15.76		2,582		3.57	.05
Sex (female)			56			63			56	2	2.20		ns
Education[1]	3.8	1.31		4.1	1.17		4.2	1.17		2,575		6.8	.001
Marital status (married)			72			65			66	2	2.29		ns.
Personal History													
Past psychiatric illness			13			11			7	2	4.29		ns
Psychiatric illness in family			8			12			3	2	13.99		.001
Previous trauma experience			26			25			14	2	12.51		.01
Trauma Characteristics													
Trapped under rubble			6			16			8	2	11.31		.01
Lost family members			15			13			11	2	1.62		ns
Lost second degree relatives			39			54			26	2	31.93		.001
Lost friends and / or neighbors			85			86			79	2	4.27		ns
Lost property			50			76			72	2	28.00		.001

[1] 1 = no schooling / illiterate, 2 = no schooling / literate, 3 = primary school, 4 = secondary school, 5 = high school, 6 = university / post-graduate studies

Table 6 continued

	Site I (n=158)			Site II (n=155)			Site III (n=273)			df	χ^2	F	p
	M	SD	%	M	SD	%	M	SD	%				
Current status of home [2]	3.3	1.30		4.3	.9		3.8	.95		2,572		30.62	.001
Participated in rescue work			35			35			34	2	.86		ns
Time since the earthquake (days)	448	39		574	13		714	28		2,583		5537.81	.001
Intensity of fear during the earthquake (0-4)	2.8	1.35		3.3	1.15		3.0	1.16		2,580		4.49	.05
Prevalence of PTSD and MDE													
PTSD			30			43			45	2,586		9.84	.01
MDE			22			28			31	2,586		4.63	ns

_____

[2] 1 = no damage, 2 = minimal damage, 3 = moderate damage, 4 = severe damage, 5 = reduced to rubble

44

screened later in the study, contained more severely traumatized survivors than the other

sites.

Incidence of PTSD and major depression symptoms

To determine the symptom presence data were recoded so that an item score of 2

or higher meant that the survivor had the symptom. Table 7 shows the resulting

percentages of survivors with and without PTSD reporting the presence of each PTSD

symptom. As would be expected, a large percentage of survivors with PTSD endorsed

each symptom, and all chi-square showed that these percentages were significantly higher

than those survivors without PTSD. Re-experiencing symptoms, defined according to

DSM-IV criteria were the most frequently reported symptoms (74%), followed by hyper-

arousal symptoms (61%) and avoidance and numbing symptoms (45%). When the

requirement of "three or more symptoms of cluster C" was changed to "two or more

symptoms" the percentage of survivors meeting criterion C rose to 59%.

The endorsement rates of MDE symptoms are shown in Table 8.

Factor analyses of the TSSC

Two factor analyses (principal axis factoring) were conducted on the TSSC. The first

factor analysis was conducted on all 23 items to examine TSSC's factorial structure and

the intercorrelations between the items. Inspection of a scree plot yielded an array of 2

factors that most adequately described the symptoms examined. The analysis yielded two

factors, which explained 46% and 6% of the total variance. The first one was a general

factor with high positive loadings ranging from .39 to .79. This supported the internal

Table 7

Prevalence of PTSD symptoms (n=586)

	Whole sample		PTSD cases		Non-PTSD cases	
	N	%	N	%	N	%
Re-experiencing Symptoms						
Intrusive thoughts	345	59	218	93	127	36
Nightmares	150	26	116	50	34	10
Flashbacks	311	53	208	89	103	29
Distress when reminded of trauma	328	56	214	92	114	33
Physiological reactivity	185	32	160	68	25	7
1 or more re-experiencing symptoms	433	74	586	100	199	57
Avoidance Symptoms						
Avoidance of trauma reminders	259	44	191	81	68	19
Avoidance of trauma thoughts	270	46	170	73	100	29
Loss of interest	216	37	169	72	47	13
Detachment	149	26	124	53	25	7
Emotional numbing	171	29	143	61	28	8
Psychogenic amnesia	132	23	97	42	35	10
Sense of foreshortened future	247	42	173	74	74	21
3 or more avoidance symptoms	261	45	586	100	51	15
Hyperarousal Symptoms						
Insomnia	193	33	143	61	50	14
Irritability	311	54	201	87	110	32
Memory/concentration difficulty	281	48	195	83	86	25
Hypervigilance	222	38	171	73	51	15
Startle	301	52	199	85	102	29
2 or more arousal symptoms	356	61	586	100	124	35

Table 8

Prevalence of MDE symptoms

	N	%
Depressive Symptoms		
Guilt	65	11
Depressed mood	214	37
Loss of pleasure	250	43
Suicidal ideas	47	8
Loss of energy	157	27
Hopelessness	220	38

consistency of the scale. The factors were then rotated (Varimax) for a simpler solution

(see Table 9). The first rotated component, which explained 27% of the total variance

showed high loadings on hypervigilance, startle, avoidance of trauma reminders,

psychological distress when reminded of trauma, flashbacks, intrusive thoughts,

physiological reactivity, nightmares, avoidance of trauma-related thoughts and feelings,

insomnia, and amnesia. The second component, which explained 26% of the total

variance, had high loadings on emotional numbing, hopelessness, loss of pleasure, loss of

interest, detachment, loss of energy, depressed mood, memory/concentration difficulty,

irritability, suicidal thoughts, and guilt feeling. Sense of foreshortened future had

relatively high loadings on both factors. Thus, the first factor showed high loadings on

symptoms of PTSD while the second one had high loadings on depression symptoms.

That emotional numbing and detachment had high loadings on the depression factor, and

sense of foreshortened future, showed a moderately high loading on both factors suggests

47

Table 9

Factor Analysis of the Traumatic Stress Symptom Checklist (n=586)

TSSC symptoms	Factor 1	Factor 2
Hypervigilance	.75	.23
Startle	.74	.23
Avoidance of trauma reminders	.71	.20
Distress when reminded of the trauma	.71	.30
Flashbacks	.70	.31
Intrusive memories	.70	.33
Physiological reactivity	.64	.40
Nightmares	.58	.31
Avoidance of trauma thoughts	.56	.26.
Insomnia	.49	44
Psychogenic amnesia	.45	.23
Emotional numbing	.35	.78
Hopelessness	.28	.77
Loss of pleasure	.36	.76
Loss of interest	.42	.70
Detachment	.34	.69
Loss of energy	.33	.68
Depressed mood	.38	.66
Memory/concentration difficulty	.44	.56
Irritability	.45	.54
Suicidal thoughts	.05	.50
Guilt feeling	.19	.45
Sense of foreshortened future	.47	.47
Eigen values	6.1	5.9
Total variance explained	27%	26%

that these items may have partly tapped depressive symptoms, given that they had yielded

some false positive results in the previous validation study (Başoğlu et al., 2001).

Similarly, although they showed moderately high loading on both factors,

memory/concentration difficulty and irritability had higher loadings on the depression

factor.

Figure 1

Scree Plot: 23 items

Factor Number
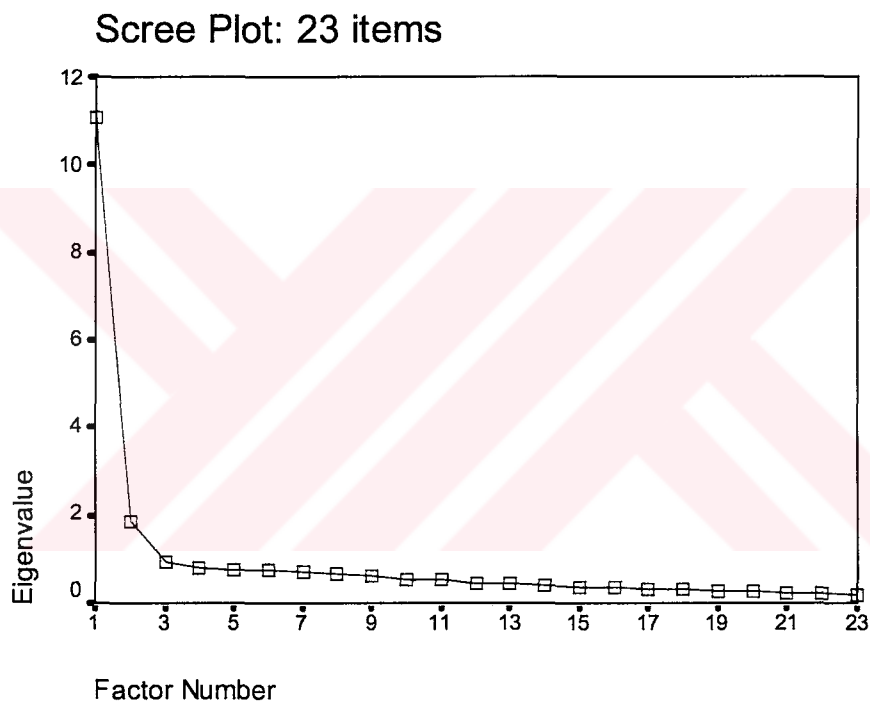
The second factor analysis was conducted on the TSSC's 17 PTSD items to

examine the factorial structure of the PTSD syndrome. This analysis failed to

replicate the DSM-IV clusters. Inspection of a scree plot yielded an array of 2 factors

that most adequately described the symptoms examined. The analysis yielded two

factors, which explained 51% and 8% of the total variance. The first one was a

general factor with high positive loadings ranging from .53 to .77. The factors were

49

Table 10

Factor Analysis of the Traumatic Stress Symptom Checklist PTSD Symptoms (n=586)

TSSC symptoms of PTSD	Factor 1	Factor 2
Startle	**.76**	.25
Distress when reminded of the trauma	**.75**	.29
Hypervigilance	**.75**	.29
Avoidance of trauma reminders	**.72**	.26
Intrusive memories	**.71**	.36
Flashbacks	**.71**	.36
Physiological reactivity	**.63**	.44
Nightmares	**.63**	.24
Avoidance of trauma thoughts	**.60**	.33
Psychogenic amnesia	**.50**	.23
Emotional numbing	.25	**.85**
Detachment	.23	**.82**
Loss of interest	.33	**.78**
Memory/concentration difficulty	.36	**.67**
Irritability	.36	**.67**
Insomnia	.41	**.59**
Sense of foreshortened future	.45	**.52**
Eigen values	**5.5**	**4.5**
Total variance explained	**32%**	**26%**

then rotated (Varimax) for a simpler solution (see Table 10). The first factor, which

explained 32% of the variance, showed high loadings on startle, emotional distress

when reminded of the trauma, hypervigilance, avoidance of trauma reminders,

intrusive memories, flashbacks, physiological reactivity, avoidance of trauma related

thoughts and feelings, nightmares and amnesia. The second factor, which explained

26% of the variance, had high loadings on emotional numbing, detachment, loss of

interest, memory/concentration difficulty, irritability, insomnia and sense of

foreshortened future. Thus, the first factor involved intrusion, avoidance and two

arousal symptoms of PTSD while the second one had high loadings emotional

numbing and the remaining arousal symptoms, which overlap with depression (i.e.,

memory/concentration difficulty, irritability, insomnia).

Figure 2

Scree Plot: 17 items

Factor Number
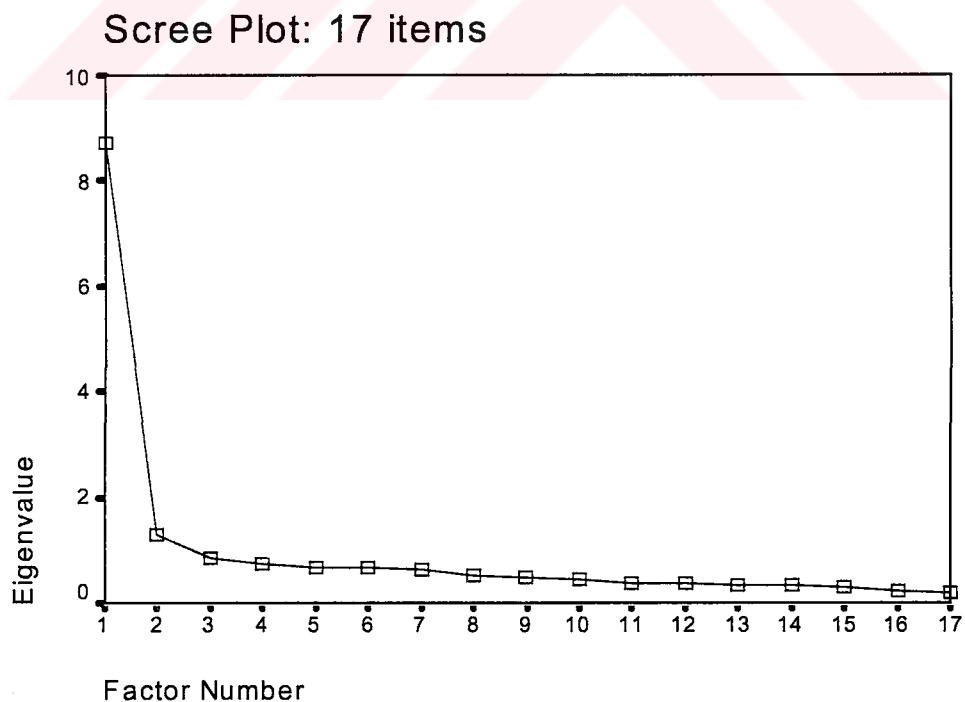
Factors predictive of post-earthquake psychological outcome

The predictor variables were selected from the SIF, which included some of the risk factors for traumatic stress. These included age, gender, education (1 - 6), past psychiatric illness, family history of psychiatric illness, history of previous trauma, having been trapped under rubble, loss of family members, loss of second-degree relatives, loss of friends and/or neighbors, material loss, participation in rescue work (all coded as 0 = no or 1 = yes), extent of damage to home (1 = no damage, 2 = minimal, 3 = moderate, 4 = severe, 5 = collapsed), location during the earthquake (0 = outside, e.g., on the street, in a car, etc, 1 = in a building), and proximity to epicenter (1 = epicenter, 2 = in Marmara region but outside the epicenter area, 3=out of Marmara region).

The respondents' scores on the two TSSC factors were selected as the outcome measures. The dichotomous measures of PTSD/non-PTSD and MDE/non-MDE were not selected because of their high inter-correlation. Indeed, 99.7% of the 351 respondents without PTSD did not have MDE and 68.5% of the 235 respondents with PTSD also had MDE [χ^2 (1, $\underline{N}$ = 586) = 324.16 $\underline{p}$ < .001]. Similarly, the total raw scores of the 17 PTSD and six depression items were also highly inter-correlated (r=.98, p<.001). Thus, uncorrelated outcome measures were needed to examine to examine the possible differential predictions on PTSD and depression symptoms.

Two separate multiple regression analyses were performed using the PTSD and depression factor scores as the dependent variables in turn and the SIF items as the independent variables. Using the enter method two significant models emerged. The predictor variables explained 29% of the total variance in PTSD symptoms [Multiple $\underline{R}$ = .56, $\underline{F}$ (18, 526) = 13.12, $\underline{p}$ < .001]. More severe PTSD symptoms were predicted by

greater fear during the earthquake ($\beta=.39$, t=9.57, p<.001), female gender ($\beta=.21$, t=4.90, p<.001), older age ($\beta=.12$, t=2.61, p<.01), participation in rescue work ($\beta=.11$, t=2.70, p<.01), loss of friends or neighbors ($\beta=.12$, t=3.12, p<.01), and past history of psychiatric illness ($\beta=.09$, t=2.35, p<.05). Having been trapped under rubble just failed to reach the significance level ($\beta = .08$, t = 1.96, p = .051). This was because being trapped under rubble and loss of friends and/or neighbors were intercorrelated variables (r = .09, p<.05), reflecting the co-occurrence of these events in the most hardly hit residential areas in the epicenter region. Indeed, when the regression analysis was repeated excluding loss of friends and/or neighbors, having been trapped under rubble entered the equation explaining a significant portion of the variance in PTSD ($\beta = .09$, t = 2.07, p<.05).

As the retrospective rating of fear could have been confounded by PTSD symptoms, its validity as an independent variable was assessed by examining what predicted fear during the earthquake. A multiple regression analysis was conducted using age, sex, education, location at the time of the earthquake, having been trapped under rubble, proximity to the epicenter, and the TSSC scores as independent variables and the intensity of fear during the earthquake as the dependent variable. The TSSC scores were included in the analysis to control for the possible effects of PTSD symptoms on retrospective ratings of fear. If the fear ratings merely reflected a confound of PTSD symptoms, then the other potential predictors of fear would not be expected to explain independent significant variance in the fear ratings. The predictor items explained 22% of the variance in the fear ratings, [Multiple $\underline{R}$ = .48, $\underline{F}$ (7, 563) = 25.54, $\underline{p}$ < .001. Greater fear during the earthquake significantly related to higher TSSC scores ($\beta = .36$, t = 8.93, $\underline{p}$ < .001), being in a building at the time of the earthquake ($\beta = .16$, t = 3.98, $\underline{p}$ < .001),

being closer to the epicenter (β = .11, t = 2.83, p < .01), and lower education (β = .10, t = 2.47, p < .05). These findings suggested that the fear ratings did not entirely reflect a possible confound of PTSD symptoms.

A second multiple regression analysis was done using the depression component scores as the dependent variable. The predictor variables explained 13% of the total variance in depressive symptoms [Multiple R = .40, F (18, 526) = 5.46, p < .001]. More severe depressive symptoms were predicted by older age (β=.19, t=3.67 p<.001), death of a family member (β=.16, t=3.62, p<.001), being single, divorced or widowed (β=.11, t=2.38, p<.05), past history of psychiatric illness (β=.10, t=2.38, p<.05), previous trauma experience (β=.09, t=2.26, p<.05), female gender (β=.10, t=2.12, p<.05), and family history of psychiatric illness (β=.09, t=2.02, p<.05).

In summary, various earthquake-related stressors showed differential predictions on PTSD and depressive symptoms. PTSD had the strongest association with greater fear during the earthquake and while depression related more to loss of close ones.

Prevalence of social disability and its determinants

On to the SDS, 266 (46%) of the survivors rated the severity of their traumatic stress symptoms as 2 (fairly severe) or 3 (extremely severe), while 95 (24%) rated the extent of impairment in their social, occupational and family functioning as 2 (fairly impaired) or 3 (extremely impaired). In our previous study of validation of TSSC and SDS (Başoğlu et al, 2001) the SDS ratings correlated highly with the corresponding Clinician Administered PTSD Scale (Blake et al.,) measures of overall subjective distress and social disability (.60 and .52, respectively). To examine which symptoms related to

social, occupational and family disability, a multiple regression analysis (method enter) was performed using the TSSC items as the independent variables and the SDS item of social, occupational and family disability as the dependent variable. The TSSC items explained 50% of the total variance in disability [Multiple $\underline{R}$ = .72, $\underline{F}$ (23, 505) = 23.85, $\underline{p}$ < .001]. Disability significantly related to detachment (ß=.21, t=4.22, p<.001), depressed mood (ß=.18, t=3.66, p<.001), loss of energy (ß=.18, t=3.76, p<.001), and loss of interest (ß=.11, t=1.96, p<.05). Thus, depression symptoms contributed more in more interference with social, occupational, and family functioning.

To investigate which traumatic stress symptoms predicted social and occupational disability a second regression analysis was performed using the symptoms that formed the PTSD factor of TSSC (i.e., intrusive memories, flashbacks, nightmares, emotional distress and physiological reactivity when reminded of the trauma, avoidance of trauma reminders, thoughts and feelings, hypervigilance, startle, insomnia, psychogenic amnesia). PTSD symptoms explained 34% of total variance [Multiple $\underline{R}$ = .59, $\underline{F}$ (4, 545) = 70.82, $\underline{p}$ < .001]. Disability was predicted by insomnia (ß=.20, t=5.97, p<.001), physiological reactivity (ß=.15, t=3.91, p<.001), emotional distress when reminded of the trauma (ß=.14, t=3.12, p<.01), and intrusive thoughts (ß=.13, t=2.82, p<.01). Thus, after insomnia, re-experiencing symptoms related to more social and occupational disability.

Reliability and Validity of the Fear and Avoidance Questionnaire

Reliability analysis of FAQ items yielded a α value of .97. The mean item-total score correlation was .45 (range .18 -.91). There was no item the omission of which resulted in a substantial increase in the α value. Thus, the scale was highly internally

55

consistent. The FAQ total sore was highly correlated with TSSC total score (r=.75, p<.001) and PTSD subscale score (r=.76, p<.001). Finally, FAQ total scores were significantly correlated wit TSSC's "avoidance of trauma reminders" item (r=.67, p<.001). The scale showed satisfactory external validity.

To extract common factors that constitute the FAQ a factor analysis (principal axes factoring) was conducted. The analysis yielded five factors, which explained 46%, 7%, 4%, 3% and 2% of the total variance, respectively (see Table 11). The first factor was a general factor with high positive loadings ranging from .46 to .79. The factors were then rotated (Varimax) for a simpler solution. The first factor, which explained 23% of the variance, showed high loadings on building related fear and avoidances, such as staying in buildings during daytime or at night, entering flats in the upper or lower floors in buildings, taking bath in a building, etc. The second factor explained 13% of the variance and showed high loadings on fear related to reminders of earthquake, such as looking at the photos of people who died in the earthquake, walking by or staying near the rubble, etc. The third factor explained 9% of the variance and had high loadings on agoraphobic fears, such as going out or traveling alone. The fourth factor again explained 9% of the variance and had high loadings on fear and avoidance of exposure to earthquake related news and talks. Finally, the fifth factor explained 8% of the variance and showed high loadings on items relating to sleep disorder. Two items showed high loading on more than one factor. Sleeping naked or with night-shirt showed relatively high loadings on factor 1, factor 3 and factor 4, going near the seaside loaded on both factor 1 and factor 3, and finally sleeping before the time at which earthquake happened loaded both on factor 3 and factor 5. The scale thus achieved a relatively clear separation between different types

Table 11

Factorial structure of the Fear and Avoidance Questionnaire (FAQ) (n=556)

FAQ items	I	II	III	IV	V
Staying in buildings at night	.85				
Staying in buildings at night alone	.81				
Sleeping in buildings at night	.78				
Entering buildings at night	.78				
Staying in buildings during daytime	.74				
Taking bath in the house when alone	.72				
Entering buildings during daytime	.64				
Entering houses in the upper floors in the buildings	.63				
Entering houses in the lower floors in the buildings	.62				
Taking a long bath in the house	.54				
Taking bath in the house when not alone	.54				
Staying in closed places	.54				
Entering elevators	.54				
Height	.52				
Sleeping doors locked	.46				
Sleeping naked or with pajamas	.36		.31	.31	
Looking at the photographs of people who died in the earthquake		.79			
Visiting the graves of people who died in the earthquake		.71			
Walking by the rubbles		.67			
Staying near the rubbles		.65			
Looking at damaged buildings		.64			
Looking at the reminders of the earthquake		.44			
Going out alone			.80		
Traveling alone			.70		
Going to the market			.65		

Table 11 continued

FAQ items	I	II	III	IV	V
Going near the seaside	.32		.39		
Reading earthquake related news				.65	
Watching earthquake related news				.64	
Participating in earthquake related conversations				.58	
Talking about the earthquake experience				.54	
Staying in the dark					.76
Sleeping in the dark					.75
Sleeping in the bedroom alone					.55
Sleeping without someone being awake					.44
Sleeping before the time at which earthquake happened			.32		.37
Eigen values	**8.0**	**4.7**	**3.3**	**3.0**	**2.9**
Percent explained	**22.8**	**13.4**	**9.4**	**8.6**	**8.4**

of phobic fears and avoidance behaviors of earthquake survivors. This contributed to the internal consistency of the scale.

Prevalence of Phobic Fears

A cut-off point of 2 on the FAQ was selected arbitrarily to define significant fear and avoidance of a specific activity. The selection of this criterion relied on the clinical observations in the field. Table 12 shows percent endorsement of FAQ items based on cut-off of 2. Among the most common feared and avoided situations were sleeping alone in a building at night (58%), staying alone in a building at night (55%), looking at the photos of people who died in the earthquake (50%), staying in closed spaces (46%),

staying in a building at night (45%) and visiting graves of people who died in the earthquake (45%). Overall, survivors feared and avoided a mean of 10 (SD=9.4, range=0-35) earthquake-related situations.

Phobic Fears and PTSD

To explore which phobic fears predicted the severity of PTSD better, a multiple regression analysis (method enter) was performed using the FAQ items as the independent variables and the PTSD factor scores as the dependent variable. To select the minimum number of variables necessary to account for much of the variance accounted for by the FAQ items stepwise selection method was employed. The total variance explained was 49% [Multiple R = .71, F (8,577) = 71.49, p < .001]. PTSD was predicted by fear and avoidance of sleeping before the time at which earthquake happened (i.e., 03.00 AM) (β=.16, t=4.83, p<.001), watching earthquake related news (β=.15, t=4.01, p<.001), staying in buildings at night (β=.16, t=2.95, p<.01), looking at the reminders of the earthquake (β=.11, t=2.96, p<.01), taking a bath alone in the house (β=.12, t=2.53, p<.05), sleeping in a building at night (β=.11, t=2.16, p<.05), staying in closed placed (β=.10, t=2.17, p<.05), going near the seaside (β=.08, t=2.08, p<.05). Thus, phobic avoidance of buildings and earthquake reminders was associated with more severe PTSD.

Table 12

Percent endorsement of FAQ items (n=556)

FAQ items	%
Entering buildings during daytime	13
Staying in buildings during daytime	28
Entering buildings at night	37
Staying in buildings at night	45
Staying in buildings at night alone	55
Sleeping in buildings at night	58
Sleeping in the bedroom alone	30
Sleeping before the time at which earthquake happened	14
Sleeping without someone being awake	9
Staying in the dark	30
Sleeping in the dark	26
Taking bath in the house when not alone	13
Taking bath in the house when alone	34
Taking a long bath in the house	31
Sleeping naked or with pajamas	20
Sleeping doors locked	31
Watching earthquake related news	36
Reading earthquake related news	32
Participating in earthquake related conversations	30
Talking about the earthquake experience	36
Staying in closed places	46
Height	46
Entering elevators	41
Entering houses in the upper floors in the buildings	34
Entering houses in the lower floors in the buildings	37
Going near the seaside	18

FAQ items	%
Going to the market	4
Going out alone	6
Traveling alone	7
Walking by the rubbles	32
Staying near the rubbles	35
Looking at damaged buildings	30
Looking at the photographs of people who died in the earthquake	50
Visiting the graves of people who died in the earthquake	45
Looking at the reminders of the earthquake	30

Phobic Fears and Social Disability

To explore which phobic fears related to disability, a multiple regression analysis (method enter) was performed using the FAQ items as the independent variables and the SDS overall rating of social, occupational and family disability as the dependent variable. The FAQ items explained 30% of the total variance in social disability [Multiple R = .59, $F (35,458)$ = 7.08, p < .001]. Disability significantly related to entering buildings during the day (β=.17, t=2.45, p<.05), sleeping in the bedroom alone (β=.-16, t=-2.59, p<.05), taking a bath alone in the house (β=.19, t=3.06, p<.01), and looking at the photographs of people who died in the earthquake (β=.14, t=2.03, p<.05).

The regression analysis was repeated using the stepwise selection method in order to select the minimum number of variables necessary to account for much of the variance accounted for by the FAQ items. The variance in social, occupational, and family disability explained by the FAQ items increased to 50% [Multiple R = .71, $F (9,493)$ = 56.14, p < .001]. Disability significantly related to staying in buildings at night (β=.15,

61

t=2.40, p<.05), taking a long bath (ß=.12, t=2.64, p<.01), staying in the dark (ß=.11, t=2.67, p<.01), taking a bath alone in the house (ß=.11, t=2.53, p<.05), sleeping in a building at night (ß=.17, t=3.12, p<.01), entering elevators (ß=.11, t=2.56, p<.05), entering buildings during the day (ß=.13, t=2.74, p<.01), traveling alone (ß=.-10, t=-2.63, p<.01), and looking at the reminders of the earthquake (ß=.08, t=2.01, p<.05). Thus, phobic avoidance of buildings and related activities contributed more to interference with functioning.

Predictors of help seeking behavior

To determine the predictors of help seeking behavior a multiple regression analysis (method enter) was conducted using the SIF variables, PTSD, depression and fear and avoidance factor scores as independent variables and SDS item of help request (0=no, 1= not sure, 2= yes) as the dependent variable. The predictor variables explained 30% of the total variance [Multiple $\underline{R}$ = .58, $\underline{F}$ (26,425) = 8.35, $\underline{p}$ < .001]. Help seeking behavior related to more subjective distress (ß=.28, t=4.31, p<.001), more interference with social, occupational and family functioning (ß=.17, t=2.88, p<.01), personal history of psychiatric illness (ß=.09, t=2.10, p<.05), and severer depressive symptoms (ß=.16, t=2.74, p<.01).

DISCUSSION

Prevalence of PTSD and major depression

The adjusted rates of PTSD and depression in this sample were 38.5% and 27%, respectively. In the previous study on the validation of TSSC (Başoğlu et al., 2001), 49% of the 130 survivors had PTSD, according to both the CAPS and the TSSC. The percentage of depression in that study, however, was overestimated by 9% by the TSSC. If the same margin of error applies to the present study, the rate of depression is more likely to be around 18%. Several factors might have contributed to such high rates of PTSD and depression in this study sample: the sample was exposed to severe trauma, stress reactions were exacerbated by frequent aftershocks that followed the earthquake for many months, and expectations of yet another future earthquake, the epicenter of which is expected to be much nearer Istanbul, was continuously fueled by the media. Other studies of earthquake survivors with high trauma exposure (Armenian et al., 2000; de la Fuente, 1990; Goenjian et al., 2000) have also reported similarly high rates. Loss of monetary and social-network resources, and difficult post-disaster living conditions might also have contributed to difficulty in post-disaster psychological adjustment. Such high estimated rates of PTSD and depression approximately two years after the earthquake suggests a chronic course for traumatic stress, a finding also reported in other studies (Goenjian et al., 2000; Karanci & Rüstemli, 1995). This finding points to the need of implementing effective national mental health care policies for psychological care of survivors of earthquake. Furthermore, psychological care efforts need to be long term because of the nature of the chronic course and the possible delayed onset of the posttraumatic stress problems.

Incidence of PTSD symptoms and Factor Analysis of TSSC

In this sample re-experiencing symptoms, defined according to the DSM-IV criteria were the most frequently reported symptoms (74%), followed by hyper-arousal symptoms (61%) and avoidance and numbing symptoms (45%). This pattern is consistent with the literature evidence reviewed earlier. As would be expected, a large percentage of survivors with PTSD endorsed each symptom. Compared to other PTSD symptoms, nightmares, detachment, emotional numbing, psychogenic amnesia, and insomnia were the least frequently reported symptoms among survivors with PTSD. Conversely, a substantial proportion of survivors without PTSD reported re-experiencing and arousal symptoms. Among survivors without PTSD avoidance of trauma activities was the most prevalent symptom reported in the C cluster. The rates of emotional numbing, detachment, and psychogenic amnesia were quite low for both survivors with and without PTSD. This pattern of results supports the previous evidence that the numbing symptoms are the least frequently reported symptoms of PTSD (Solomon & Canino, 1990; Green, 1993; Kilpatrick & Resnick, 1993; North et al., 1989).

The factor analysis of the TSSC yielded factors that were not consistent with the PTSD symptom clusters defined by the DSM-IV. Emotional numbing, detachment, memory and concentration difficulty and irritability symptoms were clustered together with symptoms of depression. This finding suggests that these items might be tapping depression rather than PTSD. Indeed, other studies reported a similar inconsistency in factor loadings. In a study (Foa, Riggs, & Gershuny, 1995) of sexual assault survivors, avoidance and increased arousal symptoms loaded on the same factor whereas emotional numbing, as in this study, clustered together with depression items such as loss of

64

interest, detachment, irritability, and concentration difficulty. Accordingly, Foa et al. (1995) have argued that numbing and effortful avoidance relate to different phenomena and numbing symptoms should not be classified with avoidance symptoms. The findings of the present study support this point. On the other hand, in contrast to Foa et al. findings, in this study re-experiencing symptoms clustered together with arousal and avoidance symptoms. The co-existence of re-experiencing, avoidance, and arousal symptoms reflects very much the clinical picture in earthquake survivors. Such co-existence could be explained by exposure to a particular combination of stressors. Intrusive thoughts, flashbacks, and nightmares often involved the traumatic experiences during and/or after the earthquake. Emotional distress and physiological reactivity when reminded of the trauma were often due to regular exposure to the reminders of the disaster still prevalent in the region and due to difficult post-disaster living conditions. Avoidance of trauma thoughts and reminders may reflect a coping effort with fear of earthquakes and the distress when faced with trauma reminders. Finally, hypervigilance and startle may be due to the conditioning effects of after-shocks.

Thus, the particular combination of symptoms in this study may reflect the particular characteristics of earthquake trauma and the post-disaster circumstances in Turkey. Further work is needed to study the possible differences in symptom profiles following different traumatic events in different socio-cultural settings. Furthermore, such differences would need to be taken into account in future revisions of the DSM-IV. The results of the present study support the point that two symptoms would be enough to meet the C criterion of the PTSD diagnosis rather than the current requirement of three symptoms (Green, 1993). More studies are needed to accumulate enough evidence to

support this point.

Factors predictive of post-earthquake psychological outcome

The risk factors for PTSD in our study group are consistent with the literature

evidence reviewed earlier. As hypothesized, PTSD and depression related to different

types of stressors. Fear during the earthquake was more strongly associated with

traumatic stress symptoms whereas loss of family members related to depression.

Differential prediction of PTSD and depression was reported in some other studies. In a

study of torture survivors (Başoğlu et al., 1994), subjective severity of trauma predicted

PTSD and not depression whereas lack of social support related to depression but not to

PTSD. These findings have important implications in the selection of appropriate

treatment strategies for trauma survivors. Indeed, if loss relates to depression but not to

PTSD in earthquake survivors, then social support may alleviate depression but not

PTSD; the latter may require specific psychological interventions to reduce the impact of

the trauma (Başoğlu et al., 1994).

Fear during the earthquake was more strongly associated with traumatic stress

symptoms than the experience of subsequent stressors, such as the rubble experience. The

distressing nature of an earthquake may be explained by its total unpredictability and

uncontrollability, factors that maximize the impact of a stressor (evidence reviewed by

Başoğlu & Mineka, 1992). The majority of earthquake survivors were caught

unexpectedly in their sleep and their accounts emphasize their total helplessness during

the violent tremors. On the other hand, many were able to use various coping strategies

during subsequent events, which may have enhanced their sense of control and thereby

reduced their distress. Many survivors who were trapped under the rubble, for example, gave accounts of various coping strategies that helped them to survive for hours or days until they were rescued.

A relationship between the perceived severity of trauma and PTSD was also reported in other studies (Başoğlu & Paker, 1995; Ehlers, Mayou, & Bryant, 1998). This finding suggests that mere exposure to the stressor is less likely to be associated with PTSD; rather its appraisal and perceived severity may be more highly associated with the disorder. In a study of rape victims (Kilpatrick et al; 1989) it was found that those victims who perceived the assault to be life-threatening were more likely to develop PTSD than those who did not have this perception. Although the retrospective ratings of fear in this study might be confounded by current symptoms, these ratings appeared to have some validity as a predictor as they related to certain situations that would be expected to increase fear (e.g. being closer to the epicenter, being in a building).

Other factors that constituted risk for PTSD in this study are in line with the literature evidence. Female gender (Sharan et al, 1996; Carr et al., 1997; Başoğlu et al., in press), older age (Carr et al., 1997), and previous psychological problems (Nolen-Hoeksema & Morrow, 1991; Başoğlu et al., in press) were reported as risk factors for PTSD in other studies as well. The predictive power of participation in rescue work might have brought about by its strong association with other traumatic events. Indeed, participation in rescue efforts involved additional exposure to extremely disturbing scenes of live or dead people trapped under rubble, mutilated bodies, and severely injured people. The rescue process also evoked intense anxiety, feelings of helplessness, desperation, anger, self-blame, and guilt arising from inability to rescue most of the

people trapped under rubble. Many survivors spent days, frantically trying to rescue their loved ones, friends or neighbors, often with primitive tools or even bare hands. Some people knew their loved ones were trapped alive because they could hear their voice but were unable to help them. Many survivors thus felt frustrated and angry towards the local and national government authorities for their slow response in coming to the rescue of the survivors. Finally, participation in rescue efforts involved exposure to some people's behavior, which was perceived as selfish, insensitive, or even inhuman. Witnessing such events often led to anger, disillusionment, or loss of faith in people. These issues are important in the treatment of earthquake survivors who have been exposed to such stressors and thus need more attention in the future, especially in countries where earthquakes cause widespread devastation. These findings, however, cannot be generalized to professional or voluntary rescue teams, as this study group did not involve such people.

Being trapped under rubble was also a particularly horrifying experience, which in some cases lasted as long as 10 days. Because the earthquake happened at 3:00 am, most people were caught in their sleep. Many rubble survivors were trapped within the first few seconds of the earthquake, often with their close ones. In some cases survivors witnessed their close ones' severe injuries and slow death under the rubble. Some others spent days under the rubble without food and water. It is thus conceivable that this experience still related to PTSD 20 months after the earthquake. No other study has examined the independent effects of this stressor so it is not possible to compare this study with others in this respect.

Vulnerability factors for depression found in this study, loss of family members, female gender, older age, being single, divorced or widowed, past history of personal and familial psychiatric condition, are consistent with the literature evidence of risk factors for depression. This pattern of prediction suggests that social support and treatment strategies targeting bereavement might be helpful to alleviate depression. More studies are needed to support this point.

Phobic Fears

Analyses regarding the reliability and validity of the FAQ showed good internal consistency and satisfactory external validity. The scale thus proved to be useful in determining activities and situations that evoked fear and avoidance in earthquake survivors. Overall, survivors feared and avoided a mean of 10 earthquake-related activities and situations. Most commonly avoided situations were building related (e.g., sleeping alone in a building at night, staying alone in a building at night, staying in a building at night). That looking at the photos and visiting graves of people who died in the earthquake emerged as some of the most commonly avoided activities reflects the significance of traumatic grief reactions of survivors. Indeed, sudden and untimely death, in contrast to anticipated death, may impair the expression of grief and cause a delay in the onset of the mourning process (Kohn & Levav, 1990). Studies investigating the efficacy of treatment approaches that involved exposure to the avoided activities and situations (i.e., guided mourning) showed promising improvement rates in patients with unresolved grief (Liberman, 1978; Mawson, Marks, Ramm, & Stern, 1981).

Avoidance of earthquake related situations may have important mental health,

social, and economic implications. In this study phobic avoidance of buildings and earthquake reminders was associated with more severe PTSD. After the earthquake many survivors avoided concrete buildings, including their own house, even when it was not seriously damaged. Thus, many survivors unnecessarily lived under difficult conditions in camps and prefabricated houses due to phobic avoidance. This also incurred a substantial economic burden for the government. The extent of this problem can be better appreciated if one considers that 58% of the 15,000 people who were living in shelters six months after the earthquake had safe and inhabitable houses (Committee for Tent Cities in Kocaeli: Report on the status of tent cities in Kocaeli, March 8, 2000). These survivors could have been helped by governmental policies encouraging them to re-settle in their homes. The current situation in Turkey highlights the importance of close collaboration between relief agencies and mental health professionals who can guide policies with mental health implications.

Disability and Help Seeking Behavior

In this study, depression and re-experiencing symptoms differentially related to more social, occupational, and family disability. Help seeking behavior was determined by more subjective distress, more interference with social, occupational and family functioning, personal history of psychiatric illness, and severer depressive symptoms. Based on these results it can be hypothesized that the distressing nature of re-experiencing phenomena results in depressive symptoms, which in turn increases subjective distress and interferes with functioning. Probably attempts to cope with intrusive re-experiencing through avoidance reinforce more re-experiencing symptoms,

enhancing depression. At the end of this process the individual seeks psychological care. This formulation not only explains help seeking behavior of trauma survivors but also sheds light on the high rates of co-morbidity of PTSD and depression. The methodology of this study, however, does not allow testing this hypothesis. More studies are needed to understand help-seeking behavior of trauma survivors.

Conclusions

Turkey lies within the Mediterranean sector of the Alpine-Himalayan orogenic system, which constitute one of the most seismically active continental regions with a long and well documented history of earthquakes (Erdik, Biro, Onur, Sesetyan, Birgören, 2002). Major earthquakes will continue to happen in the future. This study revealed evidence to show that major earthquakes lead to high rates of psychological problems among the survivors. These high rates of PTSD and depression at a mean of 20 months after the disaster suggest that these problems are chronic and, if left untreated, they may lead to serious psychological, social, and economic consequences for both the individual and the society. The extent of the psychological problems following devastating earthquakes necessitates effective psychological care strategies. These strategies must be planned for the long-term, mainly because of the chronic nature and the possible delayed onset of traumatic stress responses among the survivors. Certain factors should guide the choice of the right treatment strategy. For instance, if fear strongly relates to traumatic stress symptoms, then treatment strategies that target fear should be preferred. In order to save time and resources the treatment needs to be effective and cost-effective. Since earthquakes affect large numbers of people treatment strategies would be most cost-

effective if they are brief and easily disseminated. "Self-help treatment" approaches could be a good alternative to treatment delivered through therapists. Thus, alternative ways of disseminating treatment, such as self-help manuals, videocassettes, computerized treatments on CDs, and the Internet, could be tested.

Cognitive behavioral treatments, particularly exposure therapies, prove to be the most effective approaches in the treatment of posttraumatic stress reactions. The strength of evidence for exposure therapy is quite conclusive. Twelve methodologically strong outcome trials found significant improvement in PTSD patients who received exposure therapy (for a review of these studies see Rothbaum, Meadows, Resick, & Foy, 2000). Exposure therapy involves confrontation with frightening stimuli that continues until the anxiety is reduced. By continuing to expose oneself to a frightening stimulus, anxiety diminishes, leading to a decrease in avoidance behavior that was maintained via negative reinforcement. Exposure therapies are brief form of treatments and therefore they are cost-effective. Furthermore, it is easy to train mental health professionals in the delivery of exposure treatments. Finally, exposure therapies are suitable to be delivered in manualized and computerized forms. Because of these characteristics exposure therapy is a good candidate for treatment of choice for earthquake survivors.

REFERENCES

APA (1952). Diagnostic and Statistical Manual of Mental Disorders (1st Edition).

    Washington, DC: American Psychiatric Association.

APA (1968). Diagnostic and Statistical Manual of Mental Disorders (2nd Edition).

    Washington, DC: American Psychiatric Association.

APA (1980). Diagnostic and Statistical Manual of Mental Disorders (3rd Edition).

    Washington, DC: American Psychiatric Association.

APA (1987). Diagnostic and Statistical Manual of Mental Disorders (3rd Edition,

    revised). Washington, DC: American Psychiatric Association.

APA (1994). Diagnostic and Statistical Manual of Mental Disorders (4th Edition).

    Washington, DC: American Psychiatric Association.

Abramson LY, Seligman ME, & Teasdale JD (1978). Learned helplessness in humans:

    critique and reformulation. Journal of Abnormal Psychology, 87, 49-74.

Armenian, H.K., Morikawa, M., Melkonian, A.K., Hovanesian, A.P., Haroutunian, N.,

    Saigh, P.A., Akiskal, K., & Akiskal, H.S. (2000). Loss as a determinant of PTSD

    in a cohort of adult survivors of the 1998 earthquake in Armenia: Implications for

    policy. Acta Psychiatrica Scandanivica, 102, 58-64.

Başoğlu M, Mineka S (1992). The role of uncontrollable and unpredictable stress in post-

    traumatic stress responses in torture survivors. In M. Başoğlu (ed.) Torture and Its

    Consequences: Current Treatment Approaches (Chapter 9) pp 182-225.

    Cambridge University Press.

Başoğlu, M., Paker M, Paker O, Ozmen E, Marks IM, Incesu C, Sahin D, Sarimurat N

(1994). Psychological effects of torture: A comparison of tortured with non-tortured political activists in Turkey. American Journal of Psychiatry, 151, 76-81.

Başoğlu, M., Paker, M., Ozmen, E., Tasdemir, O., Sahin, D., Ceyhanli. A., Incesu, C., Sarimurat, N. (1996). Appraisal of self, social environment, and state authority as a possible mediator of post-traumatic stress disorder in tortured political activists. Journal of Abnormal Psychology, 105, 232-236.

Başoğlu M, & Paker M. (1995). Severity of trauma as predictor of long-term psychological status in survivors of torture. Journal of Anxiety Disorders, 9, 339-350.

Başoğlu, M., Livanou, M., Crnobaric, C., Drakulic, B., Dimic, S. Post-war psychiatric status in Serbian war survivors of War-I. (submitted).

Başoğlu. M., Şalcıoğlu, E., Livanou, M., Özeren, M., Aker, T., Kılıç, C., & Mestçioğlu, Ö. (2001). A study of the validity of a screening instrument for traumatic stress in earthquake survivors in Turkey. Journal of Traumatic Stress, 14, 491-509.

Başoğlu, M., Şalcıoğlu, E., & Livanou, M. Traumatic stress responses in earthquake survivors in Turkey. In press in Journal of Traumatic Stress.

Başoğlu, M., Kılıç, C., Şalcıoğlu, E., & Livanou, M. Two epidemiological studies of traumatic stress responses in earthquake survivors in Turkey. In preparation.

Bland, S., O'Leary, E.S., Farinaro, E., Jossa, F., Krogh, V., Violanti, J.M., & Trevisan, M. (1997). Social network disturbances and psychological distress following earthquake evacuation. Journal of Nervous and Mental Disease, 186, 188-194.

Bower GH (1981). Mood and memory. American Psychologist, 36, 129-148.

74

Breslau, N., Davis, G.C., Andreski, P., & Peterson,E. (1991). Traumatic events and

posttraumatic stress disorder in an urban population of young adults. Archives of

General Psychiatry, 48, 216-222.

Breslau, N., Davis, G.C., Andreski, P. ve ark. (1997). Sex differences in posttraumatic

stress disorder. Archives of General Psychiatry, 54,1044-1048.

Brewin, C.R., Dalgleish, T., & Joseph, S. (1996). A dual representation theory of

post-traumatic stress disorder. Psychological Review, 103, 4, 670-686.

Bulman, R.J., & Wortman, C.B. (1977). Attributions of blame and coping in the 'real

world': Severe accident victims react to their lot. Journal of Personality and Social

Psychology, 35, 351-365.

Burgess, A., & Holmstrom, L. (1974). Rape trauma syndrome. American Journal of

Psychiatry, 131, 981-985.

Card, J.J. (1987). Epidemiology of PTSD in a national cohort of Vietnam veterans.

Journal of Clinical Psychology, 43, 6-17.

Carr, V.J., Lewin, T.J., Webster, R.A., Hazell, P.L., Kenardy, J.A., & Carter, G.L. (1995).

Psychosocial sequelae of the 1989 Newcastle earthquake: I. Community disaster

experiences and psychological morbidity 6 months post-disaster. Psychological

Medicine, 25, 539-555.

Carr, V.J., Lewin, T.J., Webster, R.A., Kenardy, J.A., Hazell, P.L., & Carter, G.L. (1997).

Psychosocial sequelae of the 1989 Newcastle earthquake: II. Exposure and

morbidity profiles during the first 2 years post-disaster. Psychological Medicine, 27,

167-178.

Carr, V.J., Lewin, T.J., Webster, R.A., & Kenardy, J.A. (1997). A synthesis of the findings from the Quake Impact Study: A two-year investigation of the psychosocial sequelae of the 1989 Newcastle earthquake. Social Psychiatry and Psychiatric Epidemiology, 32, 123-136.

Carr, V.J., Lewin, T.J., Kenardy, J.A., Webster, R.A., Hazell, P.L., Carter, G.L., & Williamson, M. (1997). Psychosocial sequelae of the 1989 Newcastle earthquake: III. Role of vulnerability factors in post-disaster morbidity. Psychological Medicine, 27, 179-190.

Chemtob C, Roitblat HL, Hamada RS, Carlson JG, Twentyman CT (1988). A cognitive action theory of post-traumatic stress disorder. Journal of Anxiety Disorders, 2, 253-275.

Creamer, M., Burgess, P., & Pattison, P. (1992). Reaction to trauma: A cognitive processing model. Journal of Abnormal Psychology, 101, 452-459.

Davison, J.R.T., & Fairbank, J.A. (1993). The epidemiology of posttraumatic stress disorder. In Davison J.R.T. and Foa E.B. (eds) Post Traumatic Stress Disorder: DSM-IV and beyond. American Psychiatric Press, Washington DC.

De La Fuente, R. (1990). The mental health consequences of the 1985 earthquakes in Mexico. International Journal of Mental Health, 19, 21-29.

Durkin, M.E. (1993). Major depression and posttraumatic stress disorder following the Coalinga and Chile earthquakes: A cross-cultural comparison. In Allen, R. (Ed.) Handbook of post-disaster interventions [Special Issue]. Journal of Social Behavior and Personality, 8, 405-420.

Ehlers, A., Mayou, R.A., & Bryant, B. (1998). Psychological predictors of chronic posttraumatic stress disorder after motor vehicle accidents. Journal of Abnormal Psychology, 107, 508-519.

Ehlers, A., & Clark, D.M. (2000). A cognitive model of posttraumatic stress disorder. Behavior Research and Therapy, 38, 319-345.

Ehlers, A., Maercker, A., and Boos, A. (2000). PTSD following political imprisonment: The role of mental defeat, alienation, and perceived permanent change. Journal of Abnormal Psychology, 109, 45-55.

Ehlers, A., Clark, M.D., Dunmore, E., Jaycox, L., Meadows, E., & Foa, E.B. (1998). Predicting response to exposure treatment in PTSD: the role of mental defeat and alienation. Journal of Traumatic Stress, 11, 457-471.

Erdik, M., Biro, A.Y., Onur, T., Sesetyan, K., & Birgoren, C. (2001). Assessment of earthquake hazard in Turkey and neighboring regions. Retrieved June 2, 2002, from the World WideWeb: http://www.koeri.boun.edu.tr/depremmuh/gshaptr.pdf

Davison JRT, Fairbank JA (1993). The epidemiology of posttraumatic stress disorder. In Davison J.R.T. and Foa E.B. (eds) Post Traumatic Stress Disorder: DSM-IV and beyond. American Psychiatric Press, Washington DC.

de Silva P, Rachman SJ (1981). Is exposure a necessary condition for fear-reduction? Behaviour Research & Therapy, 19, 227-232.

Dollinger SJ (1986). The need for meaning following disaster: Attributions and emotional upset. Personality and Social Psychology Bulletin, 12, 300-310.

Foa, E.B, Riggs, D. S., & Gershuny, B.S. (1995). Arousal, numbing, and intrusion:

Symptom structure of PTSD following assault. American Journal of Psychiatry, 152, 116-120.

Foa, E.B., & Kozak, M.J. (1986). Emotional processing of fear: Exposure to corrective information. Psychological Bulletin, 99, 20-35.

Foa, E.B., Steketee, G., & Olasov-Rothbaum, B. (1989). Behavioural/Cognitive conceptualisations of post-traumatic stress disorder. Behaviour Therapy, 20, 155-176.

Freedy, J.R., Shaw, D.L., Jarrell, M.P., & Masters, C.R. (1992). Towards an understanding of the psychological impact of natural disasters: an application of the conservation of resources stress model. Journal of Traumatic Stress, 5, 441-454.

Freedy, J.R., Saladin, M.E., Kilpatrick, D.G., Resnick, H.S., & Saunders, B. E. (1994). Understanding acute psychological distress following natural disaster. Journal of Traumatic Stress, 7, 257-273.

Gersons, B.P.R., & Carlier, I.V.E. (1992) Posttraumatic Stress Disorder: The history of a recent concept. British Journal of Psychiatry, 161, 742-748.

Goenjian, A.K., Najarian, L.M., Pynoos, R.S., Steinberg, A.M., Manoukian, G., Tavosian, A., & Fairbanks, L.A. (1994). Posttraumatic stress disorder in elderly and younger adults after the 1988 earthquake in Armenia. American Journal of Psychiatry, 151, 895-901.

Goenjian, A.K., Steinberg, A.M., Najarian, L.M., Fairbanks, L.A., Tashjian, M., & Pynoos, R.S. (2000). Prospective study of posttraumatic stress, anxiety, and depressive reactions after earthquake and political violence. American Journal of

Psychiatry, 157, 911-916.

Government Crisis Center. (1999, October). Press Release. Retrieved February 11, 2001, from the World Wide Web: http://www.Basbakanlik.gov.tr /krizyonetimmerkezi / 19ekimbasinbildirisi.htm

Government Crisis Center. (1999, September). Table of casualties (Deprem Zayiat tablosu). Retrieved February 11, 2001, from the World Wide Web: http://www.basbakanlik. gov.tr / krizyonetimmerkezi/depremhasar.htm

Green, B.L. (1993). Disasters and posttraumatic stress disorder (Chapter 5). In J.R.T. Davidson, & E.B. Foa (Eds.). Posttraumatic stress disorder DSM-IV and beyond (pp 75-98). America Psychiatric Press, Washington, DC.

Green, B.L. (1994). Psychosocial research in traumatic stress: An update. Journal of Traumatic Stress, 7, 341-362.

Helzer, J.E., Robins, L.N., & McEvoy, L. (1987). Posttraumatic stress disorder in the general population: findings of the Epidemiologic Catchment Area Survey. New England Journal of Medicine, 317, 1630-1634.

Herman, J.L. (1997). Trauma and Recovery: The Aftermath of Violence-From Domestic Abuse to Political Terror. New York: Basic Books.

Horowitz, M.J. (1986). Stress Response Syndromes. Jason Aronson, New Jersey.

Horowitz MJ, Becker SS (1971). Cognitive responses to stressful stimuli. Archives of General Psychiatry, 25, 419-428.

Huerta, H., & Horton, R. (1978). Coping behaviour of elderly flood victims.

Gerontologist, 18, 541-546.

Janoff-Bulman R (1979). Characterological versus behavioural self-blame: Inquiries into depression and rape. Journal of Personality and Social Psychology, 37, 1789-1809.

Janoff-Bulman R (1989). Assumptive worlds and the stress of traumatic events: Applications of the schema construct. Social Cognition, 7, 113-136.

Janoff-Bulman R (1992). Shattered Assumptions: Towards a New Psychology of Trauma. The Free Press. Maxwell Macmillan International, NY.

Joseph, S., Williams, R., & Yule, W. (1997). Understanding post-traumatic stress: A psychosocial perspective on PTSD and treatment. New York: Wiley.

Joseph, S., Williams, R., & Yule, W. (1995). Psychosocial perspectives on posttraumatic stress. Clinical Psychology Review, 15, 515-544.

Karancı, N.A., & Rüstemli, A. (1995). Psychological consequences of the 1992 Erzincan (Turkey) earthquake. Disasters, 19, 8-18.

Kato, H., Asukai N., Miyake, Y., Minakawa, K., & Nishiyama, A. (1996). Post-traumatic symptoms among younger and elderly evacuees in the early stages following the 1995 Hanshin-Awaji earthquake in Japan. Acta Psychiatrica Scandanivica, 93, 477-481.

Keane, T.M. (1993). Symptomatology of Vietnam Vetereans with Posttraumatic Stress Disorder (Chapter 6). In J.R.T. Davidson, & E.B. Foa (Eds.). Posttraumatic stress disorder DSM-IV and beyond (pp 99-111). America Psychiatric Press, Washington, DC.

Keane TM, Zimering RT, Caddell JM (1985). A behavioural formulation of post-

traumatic stress disorder in combat veterans. The Behaviour Therapist, 8, 9-12.

Kessler, R.C., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C.B. (1995).

Posttraumatic stress disorder in the National Comorbidity Survey. Archives of

General Psychiatry, 52, 1048-1060.

Kilpatrick, D.G., Resnick, H.S. (1993). Posttarumatic disorder associated with exposure

to criminal victimization in clinical and community populations (Chapter 7). In

J.R.T. Davidson, & E.B. Foa (Eds.). Posttraumatic stress disorder DSM-IV and

beyond. America Psychiatric Press, Washington, DC.

Kohn R, & Levav I. (1990). Bereavement in disaster: An overview of the

research. International Journal of Mental Health, 19, 61-76

Davidson, & E.B. Foa (Eds.). Posttraumatic stress disorder DSM-IV and beyond

(pp 113-146). America Psychiatric Press, Washington, DC.

Kilpatrick, D.G.; Saunders, B., Amick-McMullan, A.E., Best, C.L., Veronen L..J.,

Resnick, H. (1989). Victim and crime factors associated with the development pf

posttraumatic stress disorder. Behavior Tharapy, 20, 199-214.

Lewin, T.J., Carr, V., & Webster, R. (1998). Recovery from post-earthquake

psychological morbidity: Who suffers and who recovers. Australian and New

Zealand Journal of Psychiatry, 32, 15-20.

Liberman, S. (1978). 19 cases of morbid grief. British J Psychiatry, 132, 159-163

Lifton RJ, Olson E (1976). The human meaning of total disaster: The Buffalo Creek

experience. Psychiatry, 39, 1-18.

Lima, B.R., Chavez, H., Samaniego, N., Pompei, M.S., Pai, S., Santacruz, H., & Lozano, J. (1989). Disaster severity and emotional disturbance: implications for primary mental health care in developing countries. Acta Psychiatrica Scandinavica, 79, 74-82.

Madakasira, S. & O'Brien, K.F. (1987). Acute posttraumatic stress disorder in victims of a natural disaster. The Journal of Nervous and Mental Disease, 175, 286-290.

Maercker, A., & Schutzwohl, M. (1997).Long-term effects of political imprisonment: a group comparison study. Social Psychiatry and Psychiatric Epidemiology, 32, 435-442.

Maj, M., Starace, F., Crepet, P., Lobrace, S., Veltro, F., De Marco, F., & Kemali, D. (1989). Prevalence of psychiatric disorders among subjects exposed to natural disaster. Acta Psychiatrica Scandinavica, 79, 544-549.

Mawson, D., Marks, I.M., Ramm, L., & Stren, R.S. (1981). Guided Mourning for Morbid grief: A controlled study. British Journal of Psychiatry, 138,185-193.

McMillen, J.C., North, C.S., & Smith, E.M. (2000). What parts of PTSD are normal: Intrusion, Avoidance or Arousal? Data from the Northridge, California, Earthquake. Journal of Traumatic Stress, 13, 57-75.

Mollica, R., McInnes, K., Pham, T., Fawzi, M.C.S., Murphy, E., & Lin, L. (1998). The dose-effect relationships between torture and psychiatric symptoms in Vietnamese ex-political detainees and a comparison group. Journal of Nervous and Mental Disease, 186, 543-553.

Marks, I.M. (1987). Fears, Phobias, and Rituals. Oxford University Press.

Mayoral Office of Kocaeli, May 23, 2000a. Damage estimation work (Hasar tespit

çalışmaları). Retrieved February 11, 2001, from the World Wide Web: http://

www.kocaeli. gov.tr /hasar_tespit_calismalari.htm

Mayoral Office of Kocaeli, May 23, 2000b. Death and injury toll (Ölü ve yaralı durumu).

Retrieved February 11, 2001, from the World Wide Web:

http://www.kocaeli.gov.tr/ olu_yarali_durumu.htm

McCann, I.L., Sakheim, D., & Abrahamson, D.J. (1988). Trauma and victimisation: a

model of psychological adaptation. Counselling Psychologist, 16, 531-594.

McFarlane, A.C. (1989). The aetiology of post-traumatic morbidity: Predisposing,

precipitating and perpetuating factors. British Journal of Psychiatry, 154, 221-228.

Mowrer OH (1960). Learning theory and behaviour. New York, Wiley.

Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and

posttraumatic stress symptoms after a natural disaster: the 1989 Loma Prieta

earthquake. Journal of Personality and Social Psychology, 61,115-121.

Norris, F.H. (1992). Epidemiology of trauma: Frequency and impact of different

potentially traumatic events on different demographic groups. Journal of

Consulting and Clinical Psychology, 60, 409-418.

North, C.S., Smith, E.M., & Spitznagel, E.L. (1997). One year follow-up of survivors of a

mass shooting. Americal Journal of Psychiatry, 154, 1696-1702.

Papadatos, Y., Nikou, K, & Potamianos, G. (1990). Evaluation of psychiatric morbidity

following an earthquake. International Journal of Social Psychiatry, 36, 131-136.

Rescorla, R.A. (1988). Pavlovian conditioning: It's not what you think it is. American

Psychologist, 3, 151-160.

Resick, P.A., & Schnicke, M.K. (1992). Cognitive processing therapy for sexual assault

victims. Journal of Consulting and Clinical Psychology, 60, 748-756.

Resnick HS, Kilpatrick DG, Best CL, Kramer TL (1992). Vulnerability-stress factors in

the development of post-traumatic stress disorder. Journal of Nervous and Mental

Disease, 180, 7, 424-430.

Resnick, H.S., Kilpatrick, D.G., Dansky, B.S., Suanders, B.E., & Best, C.L. (1993).

Prevalence of civilian trauma and posttraumatic stress disorder in a representative

national sample of women. Journal of Consulting and Clinical Psychology, 61,

984-991.

Rubonis, A.V., & Bickman, L. (1991). Psychological impairment in the wake of

disaster: The disaster psychopathology relationship. Psychological Bulletin, 109,

384-399.

Sharan, P., Chaudhary, G, Kavathekar, S.A., & Saxena, S. (1996). Preliminary report of

psychiatric disorders in survivors of a severe earthquake. American Journal of

Psychiatry, 153, 556-558.

Shaw, J.A. (1987). Unmasking the illusion of safety: Psychic trauma in war. Bulletin of

the Menninger Clinic, 51, 49-63.

Solomon, S.D., & Canino, G.J. (1990). Appropriateness of DSM-III-R criteria for

posttraumatic stress disorder. Comprehensive Psychiatry, 31, 227-237.

Steil, R., & Ehlers, A. (1995). Maintenance of intrusive memories in posttraumatic stress

disorder: a cognitive approach. Behavioural and Cognitive Psychotherapy, 23,

217-249.

Steil, R., & Ehlers, A. (2000). Dysfunctional meaning of posttraumatic intrusions in

chronic PTSD. Behaviour Research and Therapy, 38, 537-558.

Steinglass, P., & Gerrity, E. (1990). Natural disasters and posttraumatic stress disorder:

Short-term versus long-term recovery in two disaster affected communities.

Journal of Applied Social Psychology, 20, 1746-1765.

Sungur, M.Z. Kaya, B. (2001). The onset and longitudinal course o a man-made

posttraumatic morbidity: Survivors of the Sivas disaster. International Journal of

Psychiatry in Clinical Practice, 5, 195-202.

Taylor SE, Lichtman RR, Wood JV (1984). Attributions, beliefs about control,

adjustment to breast cancer. Journal of Personality and Social Psychology, 46,

489-502.

Ursano RJ, Kao TC, Fullerton CS (1992). Posttraumatic stress disorder and meaning:

Structuring human chaos. Journal of Nervous and Mental Disease, 180, 12, 756-59.

Wang, X., Gao, L., Shinfuku, N., Zhang, H., Zhao, C., & Shen, Y. (2000). Longitudinal

study of earthquake-related PTSD in a randomly selected community sample in

North China. American Journal of Psychiatry, 158, 1260-1266.

World Health Organization (1993). Mental disorders: Glossary and guide to their

classification in accordance with the tenth revision of the international

classification of diseases. WHO, Geneva.

Wong PTP, Weiner B (1981). When people ask 'why' questions, and the heuristics of

attributional search. Journal of Personality and Social Psychology, 40, 650-663.

Watson, C.G., Kucala, T., Juba, M., Anderson P.E.D., & Anderson, D. (1991). A factor

analysis of the DSM-III posttraumatic stress disorder criteria. Journal of Clinical

Psychology, 47, 205-214.

APPENDICES

APPENDIX A

SCREENING FORM FOR SURVIVORS OF EARTHQUAKE (SITSES)

DEPREM SONRASI TRAVMATİK STRES TARAMA ÖLÇEĞİ

BÖLÜM I: DEPREMZEDE BİLGİ FORMU

1. Adınız - Soyadınız : ....

2. Yaşınız: ....

3. Cinsiyetiniz: 1= Erkek   2= Kadın

4. Eğitiminiz: 1=Hiç yok   2=Okuma/yazma 3=İlkokul 4=Ortaokul 5=Lise

            6=Üniversite 7=Üniversite sonrası

5. Mesleğiniz: ....

6. Medeni haliniz: 1 = Evli 2 = Bekar   3 = Dul   4 = Ayrılmış

7. Deprem sırasında oturduğunuz yer (il, ilçe ve köyü BELİRTİNİZ):.......................

8. Deprem sırasında oturduğunuz ev sizin miydi?   1 = Evet   2 = Hayır, kiracıydık

                                    3 = Başka..............

9. Adresiniz: ....

10. Varsa telefon numaranız: ....

11. Bir yakınınızın ismi, adresi ve telefon numarası:..

12. Aşağıdaki depremlerin hangilerini hissettiniz?

   1 = Gölcük depremi (7.4)   2 = Düzce depremi (7.2)

   3 = Her ikisini de   4 = Hiçbirini hissetmedim

13. Gölcük depremi (7.4) sırasında neredeydiniz?

     1 = Kendi evimde   2 = Bir başka evde veya binada   3 = Sokakta

     4 = Bir taşıt aracında   5 = Başka.................

14. Düzce depremi (7.2) sırasında neredeydiniz?

     1 = Kendi evimde   2 = Bir başka evde veya binada   3 = Sokakta

     4 = Çadırda   5 = Bir taşıt aracında   6= Başka........................

15. Herhangi bir depremde bulunduğunuz binada çökme oldu mu?

    0 = Hayır   1 = Evet   2 = Bir binada değildim

16. Enkaz altında kaldınız mı?   0=Hayır   1=Evet

17. Ailenizden can kaybı oldu mu?   0=Hayır   1= Evet

    (Cevap EVET ise) Kimler?   1=Anneniz 2=Babanız 3=Kardeş(ler)iniz

    4=Eşiniz   5=Oğlunuz / kızınız   (Toplam kaç yakınınız?: ....)

18. Akrabalarınız arasında can kaybı oldu mu?   0=Hayır 1=Evet

                         (Toplam kaç akrabanız?............)

19. Arkadaşlarınız veya komşularınız arasında can kaybı oldu mu?

       0=Hayır   1= Evet

20. Ciddi miktarda mal kaybınız oldu mu?   0=Hayır   1=Evet

21. Kurtarma çalışmalarına katıldınız mı?   0=Hayır   1=Evet

22. Eviniz için hasar tespiti yapıldı mı?   0=Hayır   1=Evet

23 Evinizin şu andaki durumu nedir?

       1 = Sağlam   2 = Az hasarlı   3 = Orta hasarlı

       4 = Ağır hasar nedeniyle oturulmayacak durumda   5 = Depremde yıkıldı

       6 = Emin değilim / Bilmiyorum   7 = Başka ....

24. Şu anda nerede kalıyorsunuz?

       1= Her zaman oturduğum evde   2 = Yeni bir evde   3 = Çadırda

       4 = Prefabrik konutta   5 = Başka...................................

25. Depremden önce sizde şiddetli korku ya da dehşet yaratan bir doğal felaket (deprem,

sel gibi) ya da ölüm tehlikesi içeren herhangi bir olay (yangın, trafik kazası, yaralanma,

bir saldırıya maruz kalma, gibi) yaşadınız mı?

       0=Hayır   1=Evet (Kısaca belirtiniz................................)

26. Depremden önce tedavi gerektiren bir ruhsal hastalık geçirdiniz mi?

       0=Hayır   1=Evet (Belirtiniz...................)

27. Anne, baba ve kardeşleriniz arasında depremden önce tedavi gerektiren bir ruhsal

hastalık geçiren var mı?

       0=Hayır   1=Evet (Belirtiniz...)

28. Deprem sırasında yaşadığınız korku ve dehşeti aşağıdaki ölçeğe göre nasıl

değerlendirirsiniz?

       0 =Hemen hiç korku yaşamadım   1 = Biraz   2 = Oldukça   3 = Şiddetli

       4 = Çok Şiddetli

BÖLÜM II: TRAVMATİK STRES BELİRTİ ÖLÇEĞİ

Aşağıda depremden sonra birçok insanın yaşadığı bazı sorunlar sıralanmıştır. Lütfen SON BİR HAFTA İÇİNDE bu sorunların sizde olup olmadığını, varsa sizi ne derecede rahatsız ettiğini belirtiniz (uygun kolonun altına X koyunuz).

	HİÇ RAHATSIZ ETMİYOR	BİRAZ	OLDUKÇA	ÇOK RAHATSIZ EDİYOR
1. Depremle ilgili bazı anıları /görüntüleri aklımdan atamıyorum.				
2. Bazen yaşadıklarım birdenbire gözlerimin önünden bir film şeridi gibi geçiyor ve sanki herşeyi yeniden yaşıyorum.				
3. Sık sık korkulu rüyalar görüyorum.				
4. Yeniden deprem olacak korkusu ile bazı şeyleri kolaylıkla yapamıyorum (örneğin: sağlam evlere girmek, banyo yapmak, yalnız ya da karanlıkta yatmak gibi).				
5. Hayata karşı ilgim azaldı.				
6. İnsanlardan uzaklaştığımı, onlara karşı yabancılaştığımı hissediyorum.				
7. Sanki duygularım ölmüş gibi geliyor.				
8. Uyumakta güçlük çekiyorum.				
9. Daha çabuk sinirleniyor ya da ökeleniyorum.				
10. Unutkanlık veya dikkatimi yaptığım işe toplamakta güçlük çekiyorum.				
11. Her an deprem olacak kaygısıyla tetikte duruyorum.				
12. Ani bir ses ya da hareket olduğunda irkiliyorum.				
13. Herhangi bir şey bana depremle ilgili yaşadıklarımı hatırlatınca rahatsızlık duyuyorum.				

14. Depremde yaşadığım olaylarla ilgili düşünceleri ve duyguları aklımdan atmaya çalışıyorum.				
15. Depremde yaşadığım olayların bazı bölümlerini hatırlamakta güçlük çekiyorum.				
16. Deprem bana her an ölebileceğimi farkettirdiği için uzun vadeli planlar yapmak bana anlamsız geliyor.				
17. Herhangi bir şey bana depremle ilgili yaşadıklarımı hatırlatınca çarpıntı, terleme, baş dönmesi, bedenimde gerginlik gibi fiziksel belirtiler oluyor.				
18. Kendimi suçlu hissediyorum.				
19. Kendimi üzüntülü ve kederli hissediyorum.				
20. Hayattan eskisi gibi zevk alamıyorum.				
21. Gelecekten umutsuzum.				
22. Zaman zaman aklımdan kendimi öldürme düşünceleri geçiyor.				
23. Gündelik işlerimi yapacak gücüm azaldı.				

BÖLÜM III: YETİ YİTİMİ FORMU

1. Yukarıdaki sorunlar sizin için ne derecede rahatsızlık/sıkıntı/sorun yaratıyor?

    0=Hiç   1=Hafif derecede   2=Oldukça   3=Şiddetli

2. Yukarıdaki sorunlar işinizi, aile yaşamınızı ve insanlarla ilişkilerinizi ne derecede aksatıyor?

    0= Sorun yok / Hiç aksatmıyor. Her zamanki normal yaşamımı sürdürebiliyorum.

    1= Biraz aksatıyor. Biraz çabayla normal yaşamımı sürdürebiliyorum.

    2= Oldukça aksatıyor. Normal yaşamımda önemli ölçüde aksamalar var.

    3= Şiddetle aksatıyor. Gündelik yaşamımda yapmam gereken birçok şeyi yapamıyorum.

3. Ruhsal durumunuzla ilgili olarak bir doktorun/psikoloğun yardımını istiyor musunuz?

    0= Hayır   1= Evet   2= Emin değilim, bilmiyorum

92

APPENDIX B

FEAR AND AVOIDANCE QUESTIONNAIRE (FAQ)

KORKU VE KAÇINMA ÖLÇEĞİ

Aşağıda depremi yaşayan insanlarda korku, sıkıntı veya rahatsızlık yaratabilecek bazı faaliyetler sıralanmıştır. Lütfen sizde yarattığı **korku, sıkıntı** veya **rahatsızlık** nedeniyle bu faaliyetleri gerçekleştirmekte ne derecede güçlük çektiğinizi yandaki uygun sütunun altına X işareti koyarak belirtiniz.

Çok kolay = Hiç güçlük yok. Rahatlıkla yapabiliyorum.
Biraz zor = Biraz güçlük çekiyorum. Bazen yapamıyorum.
Oldukça zor = Oldukça güçlük çekiyorum. Çoğu kez yapamıyorum.
Çok zor = Çok şiddetli güçlük çekiyorum. Hiçbir zaman yapamıyorum.

	Çok kolay	Biraz zor	Oldukça zor	Çok zor
1. Sağlam binalara gündüz girmek				
2. Sağlam binalara gece girmek				
3. Sağlam binalarda gece kalmak				
4. Sağlam binalarda gündüz yalnız kalmak				
5. Sağlam binalarda gece yalnız kalmak				
6. Sağlam binalarda gece yalnız uyumak				
7. Gece odada yalnız uyumak				
8. Depremin olduğu saatten önce uyumak				
9. Evde (çadırda) uyanık kişi olmadan uyumak				
10. Karanlıkta kalmak				
11. Karanlıkta uyumak				
12. Sağlam bir evde birileri varken banyo yapmak				
13. Sağlam bir evde yalnızken banyo yapmak				
14. Banyoda eskiden olduğu kadar uzun kalmak				
15. Soyunarak (pijama/gecelikle) yatağa girmek				
16. Sağlam bir evde gece yatarken kapıları kapamak veya kilitlemek				
17. Televizyonda deprem haberlerini izlemek				
18. Gazetelerde deprem haberlerini okumak				
19. Depremle ilgili konuşmalara katılmak				
20. Depremde yaşanan olayları anlatmak				
21. Kapalı yerlerde kalmak				
22. Yüksek yerlere çıkmak				
23. Asansöre binmek				

	Çok kolay	Biraz zor	Oldukça zor	Çok zor
24. Sağlam binaların üst katlarına çıkmak				
25. Sağlam binaların alt katlarına girmek				
26. Deniz kıyısına gitmek				
27. Çarşıya alışverişe gitmek				
28. Yalnız dışarı çıkmak				
29. Yalnız toplu taşıma araçlarına binmek				
30. Enkazların bulunduğu alanlardan geçmek				
31. Enkazların yanına kadar gitmek				
32. Hasarlı binalara bakmak				
33. Depremde ölen tanıdıkların resimlerine bakmak				
34. Depremde ölen tanıdıkların mezarlarını ziyaret etmek				
35. Deprem olabileceğini düşündüren şeylere bakmak (örn. gökyüzü, deniz, hayvanlar, gibi)				