VARIABLES RELATED TO EARTHQUAKE PREPAREDNESS BEHAVIOR

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ABSTRACT

VARIABLES RELATED TO

EARTHQUAKE PREPAREDNESS BEHAVIOR

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This study examined some factors to understand earthquake preparedness behavior. The roles of demoghraphic characteristics of the participants, trait anxiety, the severity of exposure of past earthquake experience, outcome efficacy (perceived effectiveness of preparedness), self efficacy (perceived difficulty of preparedness), impact of past experience (avoidance and intrusion symptom levels of impact of event scale), threat perception, locus of control and four factors of coping strategies (problem focused approach, fatalistic coping, helplessness/self blaming approach and seeking social support) in predicting earthquake preparedness behavior were studied. Data was collected by a questionnaire consisting of three parts. The first part was a socio-demographic information form. The second part of the questionnaire included sets of items designed to examine past earthquake experience, the severity of past earthquake

experience, estimations of the severity of a possible future earthquake, probability of occurence of a potential future earthquake, reasons to prepare and responsibility related to preparedness. The third part of the questionnaire consisted of four scales. These scales were Ways of Coping Inventory (WCI) to measure coping strategies in stressful situations, Impact of Event Scale (IES) to measure current subjective distress trait part of the State-Trait Anxiety Inventory (STAI) to measure the level of trait anxiety of persons and Revised and Translated Mulilis- Lippa Earthquake Preparedness Scale (MLEPS) to measure the level of earthquake preparedness behavior, perceived difficulty of being prepared and perceived effectiveness of being prepared.

Two hundred eighteen adults (120 females and 98 males with an age range of 20 to 67) were participants of the study. There were participants from all 32 districts of İstanbul in the sample. Data was collected in two departments of Istanbul Technical University, which were architecture and civil engineering, Psychology Department of Middle East Technical University, High School of Kabataş Erkek Lisesi and İstanbul Bahçelievler Primary School. Participants were parents of students.

The regression analysis results revealed that, severity of exposure of past earthquake experience, avoidance, self-efficacy and outcome efficacy were found to be significantly related to earthquake preparedness. Considering significant predictors, the severity of the exposure to past earthquake experience and perceived effectiveness of being prepared increases the level of earthquake preparedness behavior; perceived difficulty of being prepared and avoidance symptom levels of impact of event scale

decreases it. As an evidence to Person Relative to Event Model, the results of the current study showed that there is a significant relationship between both perceived effectiveness of being prepared and perceived difficulty of being prepared with the level of earthquake preparedness level.

The importance of the results of the current study and their shortcomings were discussed within the earlier findings on disaster preparedness literature.

Keywords: Disaster, Earthquake Preparedness Behavior, İstanbul Earthquake, Coping Strategies, PRE Model

ÖZ

DEPREME ÖNLEM ALMA DAVRANIŞINI
YORDAYAN FAKTÖRLER

Şakiroğlu, Mehmet
Yüksek Lisans, Psikoloji Bölümü
Tez Danışmanı: Prof. Dr. A. Nuray Karancı
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Bu çalışma ileride gerçekleşmesi muhtemel depremlerin zararlarını azaltıcı önlem alma davranışını yordayan faktörleri incelemektedir. Yetişkinlerin betimleyici özellikleri, depreme maruz kalma düzeyleri, kullandıkları başa çıkma stratejileri (problem odaklı yaklaşım, kendini suçlayıcı/çaresizlik yaklaşımı, kaderci yaklaşım ve sosyal destek arayışı), depremle ilgili sıkıntılar (maruz kalma ve kaçınma), önlem almanın algılanan zorluğu, önlem almanın algılanan yararlılığı, sorumluluk, algılanan tehdit ve sürekli kaygı değişkenlerinin depreme önlem alma davranışını yordama güçleri ölçülmüştür. Veriler üç bölümden oluşan anket aracılığı ile toplanmıştır. Anketin birinci bölümü katılımcının betimleyici özelliklerini incelemeye yönelik maddelerden oluşturulmuştur. İkinci bölüm, kişinin geçmiş deprem yaşantısı ve depremle ilgili sıkıntılarını, muhtemel bir depremle ilgili algılarını, önlem alma sorumluluğu algısını ve önlem alma veya almama nedenlerini ölçen maddelere ayrılmıştır. Anketin üçüncü bölümü dört farklı ölçekten meydana getirilmiştir. Bu ölçeklerden Olayın Etkisi Ölçeği

(Impact of Event, IES) ile katılımcıların depremle ilgili sıkıntıları, Başaçıkma Yolları Ölçeği (Ways of Coping Inventory, WCI) ile katılımcıların kullandıkları başa çıkma stratejileri, Sürekli Kaygı Ölçeği (State-Trait Anxiety Inventory, STAI) ile katılımcıların sürekli kaygı düzeyleri ve Geliştirilmiş Mulilis-Lippa Depreme Hazırlık Ölçeği (Revised and Translated Mulilis-Lippa Earthquake Preparedness Scale, MLEPS) ile katılımcıların depreme hazırlık seviyeleri, hazırlanmanın zorluğu ve yararlılığı ile ilgili algıları ölçülmüştür.

Çalışma örneklemi İstanbul'da yaşayan 218 yetişkinden (20-67 yaşları arasında 120 kadın ve 98 erkek) oluşmaktadır. Örneklemde İstanbul'un bütün semtlerinden katılımcılar vardır. Veriler İstanbul Teknik Üniversitesi'nin mimarlık ve inşaat mühendisliği, ODTÜ Psikoloji Bölümü, Kabataş Erkek Lisesi ve Bahçelievler İlköğretim Okulu öğrencilerinin İstanbul'da yaşayan velilerinden toplanmıştır.

Yapılan regresyon analizi sonuçları geçmiş deprem yaşantısının şiddetinin, kaçınma belirtilerinin, önlem almanın algılanan zorluğunun ve önlem almanın algılanan yararının depreme önlem alma davranışı ile anlamlı olarak ilişkili olduğunu ortaya koymuştur. Bu anlamlı çıkan faktörler ele alındığında geçmiş deprem yaşantısının şiddetinin ve önlem almanın algılanan yararının depreme önlem alma davranışını pozitif yönde yordadığını, bunun yanında, kaçınma belirtilerinin ve önlem almanın algılanan zorluğunun ise depreme önlem alma davranışını negatif yönde yordadığı görülmektedir. Bu çalışmanın sonuçlarının ortaya koyduğu algılanan zorluğun önlem alma davranışı ile arasındaki negatif ilişki ve algılanan faydanın önlem alma davranışı ile arasındaki pozitif

ilişki bulgularının “Algılanan Kaynakların Olay Algısına Göreceliği Modeli”nin ilgili argümanlarını desteklediği görülmektedir.

Çalışmanın sonuçları, önemi ve sınırlılıkları afetlere önlem alma davranışı literatürü kapsamında tartışılmıştır.

Anahtar Kelimeler: Afetler, Depreme Önlem Alma Davranışı, İstanbul Depremi, Başetme Yolları, PRE Modeli

To My Family

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CHAPTER 1

INTRODUCTION

This study investigated the factors related to earthquake preparedness behavior. The association of some demographic and some psychological variables, namely, trait anxiety, the severity of past earthquake experience, outcome efficacy (perceived effectiveness of preparedness for reducing negative outcomes in an earthquake), self efficacy (perceived difficulty of carrying out preparedness activities), psychological impact of past experience (avoidance and intrusion symptom levels of impact of event scale), threat perception, locus of control and coping strategies (problem focused approach, fatalistic coping, helplessness/self blaming approach and seeking social support) were studied in predicting earthquake preparedness behavior.

1.1. Disasters

1.1.1 Definition of Disasters and Its Transformation to Traumatic Event

According to American Psychiatric Association (APA) Task Force, the definition of disaster includes relatively sudden, highly disruptive, time limited and public events

(Vogel & Vernberg, 1993). Like the definition of APA, according to Norris (1990), disasters are sudden, uncontrollable, and mostly unexpected events and they can be conceptualized as specific events that give rise to various social, physical, and psychological deterioration. Despite having many characteristics in common, each disaster has its own unique character depending on the different historical, political, socio-cultural, geographic and economic variables (Saylor, 1993).

Litz and Roemer (1996) stated that 800 million people have been affected by a natural disaster over the past two decades, and according to Kaiser and Sattler (1996) between 1900 and 1986, natural disasters have caused 42 million deaths. Estimating prevalence ratio of natural disaster exposure in the population is not easy, however to find it, a study was conducted with 935 participants. Findings showed that the lifetime self-reported prevalence of natural disaster exposure was 22% and the most common was earthquake with 8% (Briere & Elliot, 2000).

In the psychology literature, disasters are defined as stressors which destroy property, and interfere with normal activities and cause losses (Marks & Fritz, 1954; Baker & Chapman, 1962). If disasters lead to severe threats to psychological well-being and social safety or lead to anxiety, fear and avoidance, it is called as traumatic events, which threaten on the biopsychosocial functioning of an individual, a family, a group or the whole community (Palabıyıkoglu, 2000; Joseph et al., 1997). According to initial Diagnostic and Statistical Manual of Mental Disorders-III, Revised (American Psychiatry Association, 1987) formulation, a traumatic event was conceptualized as "a catastrophic stressor that was outside the range of usual human experience". In DSM-IV

(American Psychiatry Association, 1994), this definition has been revised. If the stressor is defined as traumatic, it should be exposed to a catastrophic event involving actual or threatened death or injury, or a threat to the physical integrity of the person or others and the person's response to the event must involve intense fear, helplessness, or horror.

1.1.2. Classification of Disasters

The most widely employed classification of disasters, based on the source, has two broad categories as natural disasters and man-made disasters. A lot of disastrous events may be classified under the broad category of natural disasters, including earthquakes, hurricanes, tornados, avalanches, volcanic eruptions, land slides, floods etc. On the other hand, terrorism, war, nuclear power plant failures, airplane crashes are the examples of man-made disasters. Natural forces, human errors and technological failures can work together in some other disasters (Vogel & Vernberg, 1993). Thus, the categorization is not always clear cut, for example during an earthquake, if a building collapses because it was poorly constructed, then this natural disaster is not purely of natural in origin (Horowitz, Stinson & Field, 1991).

Research suggest that natural and man-made disasters may differ in disaster related psychological adjustment. Rubonis and Bickman (1991) found that psychopathology will be higher for natural disasters than for man-made disasters. This finding may be related to the fact that higher psychopathology occurs when the cause of the disaster is ambigious than when the cause of the disaster can be identified. In addition to this assumption, Rubonis and Bickman (1991), stated that external attributions for the causes

are associated with lower perceived control over the negative event and therefore related to higher levels of psychopathology.

In another attempt to classify the disasters, Marks and Fritz (1954) investigate them in stages and they identified 5 cyclic stages:

1. Early Recognition Stage: Evaluation of the possibility of the event.
2. Period of Expectation: Prior recognition of the possibility of disaster and adjustments has come into being.
3. Period of Impact: Encompassing maximum disruption to normal modes of life and functioning.
4. Period of Reactions: Convergence behavior, social cohesion and panic behavior are observed.
5. Period of Resconstruction: Life returns to normal.

Janis (1958) added another stage, called threat. According to Janis, in the stage of period of impact, if people are aware of an immediate and severe damage to themselves, and there are only a limited route of escape which is blocked, and they receive no contradicting information, then panic behavior is more likely to occur (Janis, 1958).

1.1.3. Psychological Effects of Disasters

Post Traumatic Stress Disorder (PTSD) is the most common psychological disorder related to disasters. PTSD appeared in DSM III-R with the definition that, following

traumatic events, some people develop symptoms of intrusive re-experiencing of trauma, avoidant behaviors, and a set of symptoms of increased pyhsiological arousal(American Psychiatry Association, 1987). In DSM-IV, diagnostic criteria for PTSD include the followings:

a) Exposure to or confrontation with a traumatic event accompanied by intense fear, helplessness or horror.
b) Persistent re-experiencing of the traumatic event in at least one of the following ways: recurrent and intrusive recollections of the event, recurrent distressing dreams, acting or feeling as if the traumatic event were recurring, distress at exposure to events that symbolize or resemble trauma.
c) Avoidance of thoughts or feelings associated with trauma, avoidance of activities or situations that arouse recollections of trauma, inability to recall important aspects of the trauma, diminished interest in previously significant activities, feelings of detachment or estrangement from others, restricted range of affect and a sense of foreshortened future.
d) Symptoms of increased arousal like, difficulty falling or staying asleep, irritability, difficulty on concentrating, hypervigilance or extraggerated startle response.
e) The duration of the disturbance must exceed 1 month.

Since past disaster experience is one of the factor which determines hazard preparedness, a brief look at the psychological consequences of disasters is necessary.

Intrusive and avoidant symptoms are two types of responses coming from studies across different types of traumatic events. According to Horowitz (1979), traumatized persons experience initially intrusive and emotionally disturbing memories. After that, victims try to use coping strategies to avoid the distressing feelings, images and thoughts. During these processes some responses revealed as symptoms of a psychopathology.

PTSD has been the most extensively studied psychological disorder in the literature. After the Loma Prieta Earthquake, participant's subjective stress response and symptoms of psychological distress were measured in an assessment of pre-post disaster. The findings showed that, PTSD symptoms continously increased from before to ten days after the earthquake (Nolen-Hoeksema & Morrow, 1991). In another study, conducted 4-6 weeks after a jet plane crash into a hotel, 34% of the survivors developed a new diagnosis of PTSD, alcohol dependence, major depression or generalized anxiety disorder (Smith, North, Mc Cool & Shea, 1990). Norris et al. (1999), performed a research after Hurricane Andrew to assess the stress and the symptom levels of 241 survivors. The results of the study showed that 20-30% of adults met criteria for PTSD.

Generally, literature confirmed that exposure to a traumatic event increase the rate of PTSD symptoms, however, PTSD is not the only result of trauma. In a study with 594 men and women, conducted one year after ExxonValdez Oil Spill, social and psychological effects of the disaster were examined. High-exposed group members were 3.6 times more likely to have generalized anxiety disorder, 2.9 times more likely to have PTSD and 1.8 times more likely to have depression than low-exposed group members (Palinkas, Downs, Petterson, & Russell, 1993). In another study conducted after a severe

earthquake in rural India, it was found that PTSD with the ratio of 23%, and depression with the ratio of 21% were the most frequent diagnosis (Sharan, Chaudhary, Kavathekar & Saxena, 1996). Adams and Adams (1984) performed a study after Mount Saint Hellen's Ashfall, and they examined behaviors resulting from the disaster as a stressor, and multiple and nontransient manifestations of stress. They classified disaster-related stress reactions as physiological and psycho-emotional responses and suggested that in overt and observable behaviors these stress reactions are manifested. In accordance with this suggestion, findings revealed that, as a consequence of disaster the likelihood of physical or psychosomatic illness, alcohol related problems, family stress, violence and aggression increased.

In addition to increasing psychological distress, disasters may cause disruptions in daily life, in living conditions and in relationships. Property loss, unemployment, declines in of social support and social participation may be other adverse effects of disasters. After Hanshin-Awaji Earthquake in Japan in 1995, the relationship between subsequent change in lifestyle and psychological stress induced by the earthquake was examined. According to the findings, PTSD scores of "change to worse" lifestyle group was higher than no or better change in life style groups, so worse change in life style might be associated with high PTSD scores in victims of the earthquake in Japan (Fukuda, Monimoto, Mure & Maruyama, 1999).

Research has demonstrated that disasters have long-term psyhological effects. Twenty months after the 1999 Marmara Earthquake, Salcıoğlu, Başoğlu and Livanou (2003) studied incidence of PTSD among earthquake survivors living in prefabricated housing

sites. The findings of this study suggest that catastrophic earthquakes have long-term psychological effects, because the estimated rates of PTSD were %39 of all participants. A study, conducted 18 months after Jupiter Cruise Ship Sinking, revealed that intrusive symptoms were still evident for survivors (Joseph, Yule, & Williams, 1997).

A survey of earthquake survivors in Erzincan was conducted 16 months after the 1992 Erzincan Earthquake. Karancı and Rüstemli (1995), studied the long-term psychological effects of this disaster. The results indicated that all participants were affected emotionally and 73% of participants, who were older than 30, informed that these emotions still disturbed them. A study, thirty months after the Herald Free Enterprise Disaster, showed that high risk of psychiatric disturbances and high level of intrusion and avoidance was indicated in 2/3 of the survivors (Joseph, Yule, Williams & Hodgkinson, 1993).

In order to explain the relationship between disasters and psychopathology, Rubonis and Bickman (1991) conducted a meta-analysis and they found that; greater psychopathology can be expected based on some criteria. When the victims are female, the disaster is natural and number of deaths are high, psychopathology can be expected as higher.

According to some researchers resource loss leads to higher psychological distress than other kinds of stressors after a disaster. The Conservation of Resources Stress Model suggests that a combination of a loss of different categories of resources will result in higher psychological distress. Resource losses can be divided into four categories as following (Kaiser & Sattler, 1996);

- resource objects (e.g., home or car),
- conditional resources (e.g., employment or marriage),
- personal characteristics resources (e.g., sense of optimism or purpose)
- energy resources (e.g., time or money).

The research in this area has suggested that resource loss not only would lead to initial psychological symptomatology soon after a disaster, but is also an important risk factor for developing long-term clinical levels of psychological dysfunction (Kaiser, Sattler, 1996).

1.1.4. Earthquakes

Earthquake is a kind of natural disaster. The classification of disasters can be made differently based on some different criteria. The nature of the onset, the predictability, the controllability and the duration can be given as examples of these criteria. Comparing with another kind of disasters can simplify the understanding of earthquakes as a special one. For this purpose, the characteristics of earthquakes based on these criteria in comparison with droughts, another kind of disaster, can be described with the following sentences;

- With respect to onset of disasters, onset of earthquakes is quite sudden, whereas droughts also have a gradual onset.

- Earthquakes are unpredictable, however, droughts can be predicted with a certain degree of accuracy.
- Although earthquakes are uncontrollable events, droughts can be controllable.
- Earthquakes last only a few minutes, whereas droughts may last months.

Therefore, earthquakes are natural, sudden, unpredictable, uncontrollable and short-lasting natural events with destructive effects (Gunes, 2001).

1.1.5. The 17 August 1999 Marmara Earthquake

The 17 August 1999 Marmara Earthquake was the worst natural disaster ever to take place in Turkey, affecting İstanbul, Sakarya, Kocaeli, Yalova, Bolu, Bursa and Eskişehir. It resulted from the rupture of the North Anatolian fault system with the magnitude of 7.4 at Richter scale. The earthquake caused 15466 deaths and 23954 injuries, and directly influenced 50% of the whole Turkish people. Death and injuries distribution based on cities can be seen from Table 1. After the earthquake, 10000 houses were totally destroyed and approxiamately 60000 houses and working places were severely damaged. The 17 August 1999 Marmara Earthquake effected a region that is the most important industry area of Turkey and the financial loss was 10 billion dollars (Sümer, Karancı, Berument & Güneş, 2001; Duyan 2000 cited in Gökler, 2001). In addition to these results, because of the severity of the earthquake, it is estimated that long-term economical and psychological consequences will be present in a large percentage of survivors.

Table 1. Distribution of 17 August 1999 Marmara Earthquake-caused deaths and injuries based on cities, affected by this earthquake (Başbakanlık Kriz Merkezi)

Residence	Number of Dead	Number of Injured
KOCAELİ	8744	9231
SAKARYA	2627	5084
YALOVA	2501	4472
İSTANBUL	978	3547
BOLU	264	1163
BURSA	263	333
ESKİŞEHİR	86	83
ZONGULDAK	3	26
TEKİRDAĞ	-	35
TOTAL	15466	23954

1.2. Disaster Preparedness

This section includes an overview of disaster preparedness and the factors that may influence levels of disaster preparedness.

1.2.1. The Concept of Disaster Preparedness

Preparedness is ensuring the readiness of a society to disasters, taking precautionary measures and responding to an impending disaster. Disaster preparedness includes any pre-disaster action that can improve the safety and effectiveness of a disaster response (Edwards, 1993). The concept of preparedness represents a series of self-protective behaviors to mitigate the loss of life and property in a disaster (Faupel et al., 1992). Having flashlight, transistor radio, first-aid kit, stocks of food and water, knowing the location of shut off valves of water, gas and electric power, fastening big furnitures with latches, getting information about what to do in case of an earthquake, attending meetings for the purpose of establishing earthquake preparedness, having earthquake insurance, reading materials and listening to messages about earthquake preparedness etc. are some of the measures that can be taken to prepare for earthquakes (Mulilis, Duval, & Lippa, 1989). In previous research disaster preparedness is examined as either a single overall construct or with some sub-categories. The most widely employed classification of disaster preparedness has three categories:

a) Material Preparedness: The material preparedness includes durable modifications of the household such as fixing tall and heavy furniture or water heater to the wall and possession of various equipment useful during a disaster such as, food and water supplies, fire extinguisher or first aid kit.
b) Planning Activities: The preparedness activities includes some arrangements. For example, determining a safe place in the house or identifying a meeting place outside the house.

c) Knowledge and Skills: The third category reflects individual's knowledge and skills about disaster itself and about preparedness methods such as joining a first aid course or reading the materials about preparedness.

Disaster preparedness is an increasingly important topic for its potential to reduce life and property losses and to control over disaster response activities. Since disasters are uncontrollable and generally unpredictable occurrences with important physical and psychological consequences, disaster preparedness gains importance in respect to mitigation of damage to life and property. Furthermore adoption of preventive or protective actions and providing knowledge about disasters should be considered as an effective strategy to cope with disaster related stress. Because expectations of future disasters cause a considerable source of stress that needs to be coped with. According to Morissey and Reser (2003) preparation for natural disasters relieve psychological distress related to the probability of the occurrence of these disasters.

Preparedness for disasters may be thought as a protective factor from PTSD. Because, if a person gets prepared for a possible future disaster, the impact will be reduced. Extreme environmental events, such as earthquakes are low-probability events and people remain generally unaware of the risks they face or they underestimate it. If earthquake is an unexpected occurrence, when it occurs, its psychological effects will be traumatic. On the other hand, if a person gets prepared for an earthquake and is aware of its destructive effects, its psychological effects won't be traumatic. According to Horowitz's social cognitive model (1986); the memories, thoughts and images which are provided by traumatic experience cannot be assimilated into individual's current existing schemata.

Since the information coming from traumatic experience cannot be integrated with the pre-existing schemata, it is kept out of conscious awareness. Completion tendency maintains the trauma-related information in active memory, causing it to break through these defences and intrude into consciousness in the form of intrusive cognitions such as flashbacks, nightmares and repetitive memories. In this respect, taking precautions, related to disaster awareness, may reduce the traumatic effects of disaster through its potential to ease the integration of disaster-related information to preexisting schemata, and by reducing possible negative consequences of disasters.

Therefore, disaster preparedness may have three possible positive consequences;

a) Reduction of the physical consequences of the event.
b) Reduction of the psychological distress related to the probability of occurence of these disasters.
c) Reduction of the traumatic stress of a future earthquake.

Although, earthquakes and other disasters frequently cause devastating damage all over the world, people, at risk, often fail to prepare for them. The answer to the question of "why do people at risk from these hazards fail to prepare more for such eventualities" includes a number of psychological factors contributing to people's failure to prepare for disasters. Examining these factors, related to disaster preparedness, provide information to public health professionals or emergency managers, who work to motivate people to prepare for disasters. Understanding psychological factors related to preparedness is central to the efforts to reduce the negative effects of disasters. The role of earthquake

preparedness studies has very important implications for disaster education programs, related programs on media and government coverage in this respect.

1.2.2. Factors Related to Disaster Preparedness

Disaster researchers have posited many factors that could predict earthquake preparedness behavior. These factors include socio-demoghraphic variables (e.g., age, household income, having school children in the home and level of education), and experiential components (e.g., having been through previous severe past earthquake experience, having relatives who suffered from injury or loss). Lindell and Perry (1992), in a review of literature, suggested that there were other factors that may also predict the adoption of earthquake preparedness behavior. These factors include perceived risk, attitudes and proximity to the earthquake itself. In addition to them Mulilis and Duval (1999) in their "Person Relative to Event Model" examined the self efficacy (beliefs regarding personal capacity to do something) and response efficacy (perceptions of whether personal actions will reduce a problem) as person variables, and severity (estimated degree of destructiveness of a potential earthquake) and probability of occurence of event (the idea of the time of a potential earthquake) as event variables in predicting earthquake preparedness behavior.

1.2.2.1. Socio-demoghraphic Factors That Predict Earthquake Preparedness Behavior

A number of variables, such as age, household income, job, having school aged children in the home, education, working status, length of residency in that place etc. may influence the likelihood of taking an earthquake preparedness action. For example, Edwards (1993) showed that individuals with higher household income were more likely to be prepared than people with lower household income. According to Edwards (1993), income is an important factor to predict earthquake preparedness, because higher income households were more likely to have the resources necessary to conduct preparedness activities.

Edwards (1993) also suggested that person with higher education were more likely to be prepared, because they are more likely to understand the relationship between earthquake preparedness and the potential of these preparedness behaviors to reduce the impact of disasters. The study of Rüstemli and Karancı (1999), showed that educational level was a significant predictor in predicting earthquake anticipation and preparedness. Fisek and her colleagues (2002) conducted a study in Istanbul after 1999 Marmara Earthquake to examine earthquake mitigation behavior, and they found that, mitigation was predicted by income and education.

Sattler, Kaiser and Hittner (2000) studied disaster preparation at the peak of Hurricane Emily and Hurricane Fran. Both in Hurricane Emily and Hurricane Fran , age; and only in Hurricane Emily income predicted preparation significantly.

Edwards (1993) also found that having children in the home is another factor related to the prediction of the likelihood of earthquake preparedness. There are two possible explanations for the positive relationship between the presence of children in the home and earthquake preparedness. Parents either may be more sensitive to the safety of their children than themselves or children may bring home preparedness information from school about self-protective measures that parents did not have.

Russell and colleagues (1995), studied the Whittier Narrows Earthquake and the Loma Prieta Earthquake to examine earthquake preparedness behavior. They found for The Whittier Earthquake that, certain demoghraphic variables, such as having higher education, being female and owning a home were associated with pre-earthquake preparedness. For post-earthquake preparedness after The Whittier Earthquake, greater levels of damage from the earthquake and having children in the home were significant factors. They found for The Loma Prieta Earthquake, pre-earthquake preparedness behavior was predicted by such socio-demoghraphic variables as having higher education, being employed, being married, owning a home and higher income. For post-earthquake preparedness, being younger and being married were significant factors in determining earthquake preparedness after The Loma Prieta Earthquake.

After 1999 Marmara Earthquake, Kasapoğlu and Ecevit (2003) conducted a study to examine the responsible behavior related to preparedness for future earthquakes. In regards to socio-demoghraphic variables, education and working status were found to be

significant predictors. Those with higher education and employment showed more preparedness.

Each of these socio-demoghraphic factors might influence other factors that might enhance the likelihood of taking an earthquake preparedness behavior. For example, according to the results of De Man and Simpson-Housley's study (1988), education was the best predictor of the perceived probability of occurence of an earthquake and perception of high perceived probability might enhance earthquake preparedness behavior. As another example from the same study of De Man and Simpson-Housley, the length of residency was a mediator between past earthquake experience and earthquake preparedness behavior, showing the importance of length of residency on preparedness behavior.

1.2.2.2. Severity of Past Earthquake Experience to Predict Earthquake Preparedness Behavior

In the literature, there are inconsistent findings on the relationship between past earthquake experience and earthquake preparedness behavior. For example, Rogers (1975), Perry (1979) and Weinstein (1989) found that past earthquake experience is a powerful predictor of preparedness, whereas De Man and Simpson-Housley (1988) and Rüstemli and Karancı (1999) found no such association between them. There are also inconsistent findings in literature about the relationship between past hurricane experience and hurricane preparedness. While Sattler et al. (2000) found a significant relationship between them, Lehman and Taylor (1987 cited in Sattler et al., 2000) found

that there was no association. These inconsistent findings on the relationship between past experience and preparedness behavior seem to originate from the complexity of the factors that determine the perceived severity of past experience to motivate protective behavior. The complex relationship between them will be discussed in detail in the results and discussion sections of the current study.

1.2.2.3. Coping Strategies in Predicting Earthquake Preparedness Behavior

Waiting for a future earthquake is a stressful situation. When a person encounters a stressor, he/she evaluates the magnitude of it and his/her perceived ability or coping resources to handle the situation. According to results of this evaluation person chooses a coping strategy to reduce the impact of the stressor. These coping strategies can be divided into two main categories; namely, problem-focused coping and emotion-focused coping. Problem-focused coping is usually seen as more effective than emotion-focused coping, because it focuses on thougths and actions to generate solutions to the causes of distress (Folkman & Moskowitz, 2000). According to Unger et al.(1998) and Duval and Mulilis (1999) the choice of coping strategy was dependent on the levels of stress related to stressful event and resources of individual. Increasing levels of threat, when resources were appraised as insufficient, decrease problem-focused coping.

By problem-focused coping strategies, the individual is directed toward managing or altering the problem through direct action. Problem-focused coping involves planning, taking direct action, seeking assisstance etc., and regarding the earthquake preparedness

people using more problem-focused coping than emotional-focused coping is expected to engage in more earthquake preparedness behavior.

On the other hand, emotion-focused coping strategies involve some maladaptive behavior, such as denial and fatalistic thinking (Carver, Scheier, & Weintraub, 1989). Earthquake is an uncontrollable event and when faced with a perceived uncontrollable event, some individuals will cope by denying that the event occured (Lazarus, & Folkman, 1984). Lehman and Taylor (1987), supported this argument in a study with the participants of two different dormitories. They found that students living in a seismically poor dormitory denied the seriousness of a potential earthquake. Students in a structually good dormitory did not deny the seriousness of a potential earthquake and were more likely to adopt preparedness measures than the students in seismically poor dormitory.

As an emotional-focused coping strategy, fatalistic thinking can lead to a reduction in earthquake preparedness behavior, because fatalistic person is likely to believe that he/she is unable to do something to decrease the hazards of a possible future earthquake. In other words, because of the uncontrollability of an earthquake, a person can believe that there would be no necessity in worrying about a possible future earthquake and no need to spend energy on preparedness. In this respect fatalism is one of the factors that may contribute to people's failure to prepare earthquakes (Lindell, & Perry, 1992; McCLure, Walkey, & Allen, 1999). As another emotional-focused coping strategy, helplessness can also lead to a reduction in earthquake preparation. The argument that hazards of an earthquake is uncontrollable resembles helplessness and so people infer

that because earthquakes are uncontrollable, their effects are also uncontrollable (McClure, 1991).

1.2.2.4. Trait Anxiety in Predicting Earthquake Preparedness Behavior

Potential future earhquakes can represent a source of anxiety because of their destructive consequences. If this anxiety is present at appropriate level, there is a positive relationship between anxiety and earthquake preparedness behavior. Lazarus (1966) stated that, when anxiety is dispositional in character, people tend to appraise any situation as threatening; and those who are high in trait-anxiety scores are more likely to take adaptive adjustments to disaster.

On the other hand, if anxiety reaches an extreme level, it can reduce the likelihood that people will prepare for earthquakes ((Paton, Smith, & Johnston, 2003). According to the study of De Man and Simpson-Housley, high trait anxiety was positively related to the perceived threat (De Man, & Simpson-Housley, 1987). Person Relative to Event Model suggested that under conditions in which resources are appraised as insufficient relative to threat, increasing absolute levels of perceived threat and anxiety will decrease problem-focused coping, and so decrease earthquake preparedness behavior.

1.2.2.5. Self Efficacy and Outcome Efficacy in Predicting Earthquake Preparedness Behavior

Self-efficacy reflects the perceptions of personal capacity to do something and outcome efficacy is the measuring of the perceptions of necessary actions in reducing a problem. In the present study, both of these variables were used. The person relative to event model, using for earthquake preparedness, predicts that increasing levels of threat when resources are appraised as sufficient relative to the magnitude of the threat will increase problem-focused coping (Mulilis, & Lippa, 1999). The results of the study of Mulilis and Duval (1990) supported this model in that if level of appraised threat increases, earthquake preparedness tend to increase as well, but only for participants who appraise their resources as sufficient relative to threat.

Mulilis and Duval (1995) conducted two other studies. In these studies, according to their resources, participants were assigned to groups as clearly sufficient, probably sufficient, and clearly insufficient relative to the magnitude of the threatening event. Findings showed that, participants in the clearly sufficient resource condition evidenced greater change in preparedness levels than did those in the probably sufficient and clearly insufficient resources condition, and participants in the probably sufficient resource condition evidenced greater change than clearly insufficient condition (Duval, & Mulilis, 1995, Duval, & Mulilis, 1997; cited in Duval, & Mulilis, 1999). The study of Paton, Smith and Johnston in disaster preparedness showed that both self-efficacy and outcome efficacy predicted problem-focused behavior or action coping being linked to earthquake preparedness behavior (Paton, Smith, & Johnston, 2003).

1.3. Stress and Coping

Stress is the result of the disturbed relationship between the person and the environment due to the external and internal demands exceeding the individual's resources for managing them (Folkman & Lazarus, 1985). When people are exposed to a stressful situation, they develop some behaviors or ways of thinking to reduce their distress (Hess & Richards, 1999). Coping is the use of thoughts and actions to manage the stressful situations. In this respect, coping is the key feature of the stress process, because it is viewed as a complex set of processes that may moderate influences of stressful situations on the physical and mental health of individual (Lu & Chen, 1996). According to recent research there is growing evidence that the ways of coping with stressful situations affect all mental health, physical health and social well being of individual (Piko, 2001). Both stress and coping are widely used concepts in the area of psychology for its theories, research and clinical practice.

1.3.1 Defining the Concept of Stress and Coping

In general, stress is a force or pressure caused by difficulties in life. Uncommon life events and common daily hassles, such as financial concerns and social obligations, are common circumstances of stress. Therefore stress is an important and one of the fundamental psychology concepts used in our everyday life. According to the cognitive theory of stress, it is defined as a relationship between the person and the environment. According to Folkman and Lazarus (1985) stress is experienced by an individual when

the demands of a specific situation are seen as exceeding the individual's resources for managing them and endangering well being and health. Depending on the meaning of the event that is appraised by the person (Folkman, 1984) and the imbalance between the person and the environment (Lazarus & Lazarus, 1994), we experience more or less stress. On the other hand, when the personal resources exceed the environmental demands, stress is low or absent. According to Lazarus (1993), person and environment are in a dynamic relationship during the stress process and this relationship can be changed by reinterpretation of the event and by efforts to cope with stressful situation.

Coping means dealing with something or a situation to manage the stressful life events and negative emotional reactions related to this thing or situation, individuals search for and develop some thoughts and actions, called coping, regardless of how well it works. If an individual succeds in coping, he/she is more successful in dealing with it or he/she is no longer in danger and reasons for emotional distress are solved. The personality of individual, the life situation being faced, the possible threat of the situation and the beliefs of the person determine the things that the individual will perform in order to change the stress level or to cope with it (Lazarus & Lazarus, 1994).

Folkman and Lazarus (1980) conceptualized coping as a mediator in the ongoing, reciprocal relationship between the person and the environment. They explained coping by a "process-oriented definition" rather than a "trait-oriented definition". They defined coping as "efforts to manage" instead of "successful management of stressors" to make a distinction between coping processes and outcomes of coping. Therefore according to

Lazarus and Folkman's definition, coping includes all efforts to manage stressful situation, regardless of how well it works (Folkman, Lazarus, 1985).

1.3.2 Steps in the Coping Process

Coping is composed of two stages of appraisal, which are important term for stress process. These two stages of appraisal process are primary appraisal and secondary appraisal, one followed by the other. The primary appraisal involving the evaluation of the seriousness of the demand and the secondary appraisal is the evaluation of the adequacy of one's resources and options for meeting the demand.

Firstly, in primary appraisal process, as the basic nature of human being, environment or an encounter is evaluated as being irrelevant, benign-positive, harm/loss, threat or challenge. This evaluation addresses firstly the question of whether an encounter is relevant to a person's well-being, if irrelevant it has no significance on the well-being and the person has no gain in the outcome. A benign-positive appraisal indicates a possible good result, on the other hand the harmful appraisals are characterized by harm/loss which refers to damage that individual has already experienced. Threat which refers to a potential harm that has not yet taken place and challenge which refers to an opportunity for growth, gain or mastery (Folkman & Lazarus, 1985). Threat causes negative emotions such as fear and anger and it depends on the individual's ability to master the dangerous situation. If the individual does not feel capable of preventing harm, the threat increases depending on the anticipated harm/loss which is also

associated with these negative emotions. Unlike threat and harm/loss, challenge triggers positive emotions.

In primary appraisal the individual represents each encounter cognitively and then appraise his/her interactions with the world in terms of the importance of the encounter for well-being on the basis of some personal and situational factors. Beliefs, commitments and attributions are important personal factors. Beliefs about control can be conceptualized according to locus of control, which is defined as internal when individuals attribute environmental events to his/her behavior, and it is defined as external when individuals tend to attribute such events to things outside their control. On the other hand, the probability of occurrence, the familiarity of event, the nature of harm/loss and the clearness of expected outcome are the examples of the situational factors of primary appraisal (Folkman, 1984).

Following the primary appraisal process, secondary appraisal begins. In secondary appraisal, the individual assesses his/her availability of coping resources through the question "What can I do?" (Folkman, & Lazarus, 1985; Quine, & Pahl, 1991). Folkman and Lazarus defined 5 types of coping resources as following (Lazarus, 1979, cited in Quine & Pahl, 1991).

1) Utilitarian Resources, e.g. education properly, money, available services.
2) Health, Energy or Morale, e.g. pre-existing physical and psychiatric illness, depression.
3) Social Networks, e.g. close interpersonal relationships.

4) General and Specific Beliefs About Their Sufficiency, e.g. self-efficacy, mastery, self-esteem

5) Problem Solving Skills, e.g. intellectual skills, cognitive flexibility, complexity and analitic ability which enable person to formulate alternative courses of action.

The possibility of future earthquake can be conceptualized as a demand requiring adaptation in the primary appraisal process. In the secondary appraisal process victims will evaluate their resources to overcome the distressing situation. During this process they will use certain coping strategies to manage the difficulties or problems encountered in the light of their resources. In the present study, potential Istanbul earthquake is hypothesized as a potential stressful encounter involving the assessment of the stressor, estimated severity and probability of occurence, and the estimation of personal resources to deal with this stressor, as self-efficacy and outcome efficacy.

1.3.3 Coping Strategies

When a person encounters a stressor, he/she evaluates the magnitude of it and his/her perceived ability or coping resources to handle the situation. According to results of this evaluation person chooses a coping strategy to reduce the impact of the stressor. In other words, coping strategies are taken in specific situations that are aimed to reduce stress (Quine & Pahl, 1991). The degree to which a person experiences stress is mainly determined by the evaluation of which coping resources are available and how it is functional. These coping strategies can be divided in two main categories. The first,

called problem-focused coping, which is directed toward managing or altering the problem through direct action. The second, called emotion-focused coping, is aimed at reducing or managing the emotional distress that is associated with the situation by reinterpreting the meaning of the situation (Carver, Scheier, & Weintraub, 1989).

Problem-focused coping is used to reduce the impact of a stressful condition, if the individual perceives that this stressor is accurately changeable, and his/her coping resources exceed the demands of the stressor. In other words, if there is something to be done, problem-focused coping is used. On the other hand, emotion-focused coping is used to reduce the impact of a stressful condition, if the individual perceives that this stressor is unchangeable and his/her coping resources don't exceed the demands of the stressor (Unger et al., 1998). In other words, if there is nothing to be done, emotion-focused coping is used. Therefore it is concluded that the choice of coping strategies depends on the extent to which the stressful conditions are seen as controllable and the individual's perceptions of his/her available coping abilities or resources.

Problem-focused coping is usually seen as more effective than emotion-focused coping, because it focuses on thougths and actions generating solution to the causes of distress (Folkman & Moskowitz, 2000), however emotion-focused coping is less effective because it focuses on the symptom rather than treating the causes (Hess & Richards, 1999). In order to adopt a problem-focused coping strategy, one must believe that his/her efforts will be effective, so outcome efficacy seems as an important determinant of employment of preventive behavior.

According to Unger et al. (1998), the choice of coping strategy was dependent on the levels of stress related to stressful event and findings show that respondents with high levels of stress were likely to use emotion-focused coping strategies. According to the findings of another study, the extreme level of threat can play a constraining role, if it creates intense emotional reactions such as fear that leads to primitive, desperate or regressive emotion-focused coping strategies (Folkman, 1984). Consistent with Unger and Folkman's arguments, Duval and Mulilis also showed that increasing levels of threat when resources were appraised as insufficient relative to threat magnitude decreased problem-focused coping (Duval & Mulilis, 1999). By the help of these findings, it can be concluded that, in order to persuade people to prepare for a potential earthquake, threat perception should be increased in proportion to the resources of individuals, because according to Duval and Mulilis (1999) perception of excessive threat may interfere with problem-focused coping.

Two general types of coping, problem-focused coping and emotional-focused coping, can potentially involve several different activities. For example, problem-focused coping involve planning, taking direct action, seeking assisstance, screening out other activities and sometimes even forcing oneself to wait before acting and emotional-focused coping involve denial, positive reinterpretation of events etc. (Carver, Scheier, Weintraub, 1989). For this reason, to study coping, researcher is able to measure these factors carefully. In order to provide it, in the current study, Ways of Coping Questionnaire will be used and its factor analysis will be conducted. Ways of Coping Questionnaire will be explained in method section and its factor structure and the reliability coefficients of these factors will be discussed in the result section.

The topic of persuading individuals to adopt effective coping strategies that promote well-being has been examined extensively. Janis and Feshback (1953), with the use of fear arousing communications and McGuire (1985), with the use of negative threat appeals presumed that when a person is convinced that a threat to well-being exists, he/she will engage in coping strategies that are intended to decrease the impact of harmful outcomes associated with this threat. According to McGuire the effectiveness of negative threat appeals in producing adaptive coping strategies has been supported in literature. Therefore specific aspects of this type of communication that one most responsible for its effectiveness were determined as features of the event and the role of person variables. In the light of these findings, Maddux and Rogers (1983) explained that the combination of variables associated with both the person (self-efficacy and outcome efficacy) and the event (severity and probability of occurence) are involved in determining the persuasiveness of the fear arousing communications and developed the protection motivation theory. Although protection motivation theory suggested an additive combinatorial rule proposing that the effect of a negative threat appeal is maximized when all person and event variables are at high levels, research in this area has given inconsistent results regarding the effects of various combinations of person and event levels on adopting coping behaviors. The person relative the event theory of Duval and Mulilis aimed to resolve these inconsistent results and suggested that a primary cognitive appraisal of a threatening event activates secondary appraisal processes involving evaluations of resources required for threat management and location of responsibility for action. These appraisals determine whether the person engages in

problem-focused coping or emotion-focused coping. In the following section "protection motivation theory" and "person relative the event theory" are discussed in detail.

1.3.4. Protection Motivation Theory

Protection Motivation Theory is a cognitive approach and it is an extension of primary and secondary appraisal processes model (Tanner, Day & Crask, 1989). According to this theory, if an event is appraised as severe, as likely to occur, and if something can be done about the event and if the person has the capability to produce recommended response, protection motivation will activate to cope with the stressful effects of this event.

Protection Motivation Theory is a theoretical approach to give a meaning to most aspects of disaster research on preparedness behavior. Therefore, this approach is closely related to the present research, which attempted to describe, predict and explain the relationship among some factors, such as self-efficacy, responsibility, and hazard preparedness.

Protection Motivation Theory was proposed by Rogers (1975) and revised by Rogers (1983). As initially proposed, if an event is appraised as severe (severity of threat), as likely to occur (probability of occurence), and if something can be done about the event (response efficacy), then protection motivation will be activated and there will be an intention to act or change behavior. On the other hand, if one or more of these values are equal to zero, no protection motivation will be aroused. According to the first version of

the theory as suggested by Rogers, to change behavior there are three important cognitive appraisal processes;

a) The probability of occurence of the threatening event,
b) The severity of the threatening event, and
c) The efficacy or effectiveness of a recommended coping response.

Later in 1983, Rogers revised the protection motivation theory and incorporated Bandura's self-efficacy theory and thus, added self-efficacy expectancy, or capability to adopt the recommended coping response, as a fourth factor. The self-efficacy expectancy was found to be the most powerful predictor of behavioral intentions in adopting a recommended coping behavior with respect to cigarette smoking in a study of Maddux and Rogers (1983).

It is also important that Rogers and Maddux were trying to get the subjects to stop an ongoing hazardous behavior which the subjects knew to be hazardous, but the current study attempts to induce subjects to start the preventive behaviors of preparing for an earthquake. Stopping an ongoing hazardous behavior which the subjects knew to be hazardous, like stopping smoking, will lead to a reduction in the subject's anxiety levels because stopping smoking will lead to a reduction in physical harm. However, preparing for an earthquake as a preventive behavior should lead to an increase in the subject's anxiety levels because performing preventive behavior for a possible earthquake requires that the subjects face the dangers of the threat psychologically, and so they may employ

certain psychological defense mechanisms, such as denying the probability of the occurence of an earthquake in order to reduce the anxiety of a possible earthquake.

Mulilis and Lippa (1990) examined behavioral change on earthquake preparedness by manipulating the variables of severity, probability of occurence, response (outcome) efficacy and self efficacy. This study investigated the behavioral effects of a negative, threat-inducing persuasive message, which were based on the theory of protection motivation theory of Rogers, on earthquake preparedness. Their results indicated that these messages could influence the earthquake preparedness behavior. Subjects, exposed to negative, threat-inducing communications, increased their earthquake preparedness. The authors indicated that subadditivity plays a role in the process instead of the theory's suggestion of additivity. The authors did not obtain any main effect for the four factors of protection motivation theory, and offered revisions of the theory, because the effects of these four cognitive factors on behavior might be more complex than the theory suggests.

The revised version of the theory was tested by Rogers and Rippetoe in 1987 by employing religious faith, fatalism, hopelessness, avoidance and wishful thinking as maladaptive behaviors and rational problem solving as an adaptive response. The variables of severity, vulnerability, fear, outcome efficacy and self-efficacy of the protection motivation theory, which were used as mediators, associated with only one of the maladaptive behaviors. According to these results the pairs were; severity of danger produced wishful thinking, beliefs in vulnerability increased the feelings of hopelessness, the emotion of fear stimulated avoidant thinking, perceiving the response as ineffective

produced fatalism and perceiving oneself as not self-efficient produced hopelessness. According to another finding of the study, the most maladaptive coping response was avoidant thinking. It weakened the adaptive response and reduced fear which had no direct positive effect on the intention to perform the recommended coping response.

Tanner et al. (1989) examined the protection motivation theory in a study with college students on sexual behavior. In this study probability of occurence was measured by students' sexual activity, self efficacy by how to store, buy and where to purchase them from and using condoms was considered as a coping response to be a dependent variable. According to the findings, the brochure with high levels of self-efficacy information produced greater intentions to adopt a coping response and there was a positive relationship between adopting coping response and perceived probability of occurence of negative outcomes. The perception of event as highly probable, participants adopted more coping behavior using condom.

1.3.5. Person Relative to Event Model:

The person relative to event model was derived from Lazarus and his colleagues' work on stress, coping and cognitive appraisals, that were mentioned earlier. Deriving from Lazarus' work, the person relative to event model aims to more clearly specify the conditions that foster problem-focused coping within the context of negative threat appeals. The person relative to event model, applied to earthquake preparedness, predicts that increasing levels of threat when resources are appraised as sufficient relative to the magnitude of the threat will increase problem-focused coping. Conversely, increasing

levels of threat when resources are appraised as insufficient relative to threat magnitude will decrease problem-focused coping.

In the person relative to event model, self efficacy (beliefs regarding personal capacity to do something) and outcome efficacy (perceptions of whether personal actions will reduce a problem) are used for person variables and severity (estimated degree of destructiveness of a potential earthquake) and probability of occurence of event (the idea of the time of a potential earthquake) are used as event variables. In summary, it argues that an important variable determining degree of problem-focused coping concerns the level of appraised coping resources relative to the level of the appraised magnitude of the threatening event (Duval and Mulilis, 1999).

Duval and Mulilis studied 112 homeowners from Los Angeles to test the hypotheses suggested by the person relative to event model. Generally, findings of the study supported the model in that if level of appraised threat increased, earthquake preparedness increased, but only for participants who also appraised resources as sufficient relative to threat. On the other hand, conditions, in which resources are appraised as insufficient relative to appraised threat, increasing absolute level of appraised threat decreased problem-focused coping. In essence, problem-focused coping was greater when appraised resources relative to event magnitude were assessed as being sufficient rather than insufficient, but for participants in the low resources conditions, level of change in preparedness decreased sharply as level of event magnitude increased from low to moderate to high (Duval and Mulilis, 1999).

As mentioned earlier, Duval and Mulilis confirmed the person relative to event model by two different studies (Duval and Mulilis, 1995, Duval and Mulilis, 1997; cited in Duval and Mulilis, 1999). First one related to earthquake preparedness (1995), and second one related to tornadoes preparedness (1997). Participants were assigned to groups that clearly sufficient, probably sufficient, or clearly insufficient resources relative to the magnitude of the threatening event. According to the results, participants in the clearly sufficient resource condition evidenced greater change in preparedness levels than did those in the probably sufficient and clearly insufficient resources condition, and participants in the probably sufficient resource condition evidenced greater change than clearly insufficient condition. On the other hand, contrary to the expectations, under low threat conditions, participants with low resource demonstrated greater change in preparedness than did those participants with high and moderate resources. This finding was contrary to both "protection motivation theory" and "person relevant to event" model.

In their paper, Williamson (1997) tried to explain this contrary finding with two possible explanations. First explanation is related to Bandura's "supremely self-efficacious person" concept. According to this explanation when a supremely self-efficacious person confronts an easy task he/she invests less energy in it and performs more poorly than persons with lower self-efficacy. This explanation can be applied to the low level of preparedness of high person resources-low threat condition, that perceiving task of preparedness as easy may lead to low levels of motivation which resulted in lower levels of earthquake preparedness. According to Williamson, the second explanation is related to Brehm's energization theory, which proposed that the positive valence of a particular

goal is a direct function of the amount of energy that is used by the person he/she prepares to do an effortful task. The amount of energy spent increases as a result of increased task difficulty of the low resource condition, the task desirability also increases, which leads to high levels of task performance in other words the increased energy spent as a function of high perceived task difficulty increases the perceived desirability of the task and therefore leads to an increase in the level of problem focused coping or earthquake preparedness behavior.

1.4. Aims of the Study

The present study aims to investigate the factors related to earthquake preparedness, any specific measure taken by the subject for the purpose of mitigating damage in case of an earthquake. In order to examine earthquake preparedness behavior and variables related to preparedness, the following aims were determined;

1) Examining the predictive power of
    a. Sociodemoghraphic variables
    b. Psychological variables: Trait anxiety, psychological impact of past experience (avoidance and intrusion symptom levels of impact of event scale), threat perception, locus of control and coping strategies (problem focused approach, fatalistic coping, helplessness/self blaming approach and seeking social support).
    c. Earthquake related variables: the severity of past earthquake experience, outcome efficacy (perceived effectiveness of

preparedness for reducing negative outcomes in an earthquake), self efficacy (perceived difficulty of carrying out preparedness activities)

2) Examining the level of earthquake preparedness, self-efficacy and outcome efficacy in a sample from a high seismically vulnerable province in Turkey.

CHAPTER 2

METHOD

2.1. Sample

Two hundred eighteen adults from different districts of Istanbul participated in this study. Fifty-five percent of the sample (n=120) was female and 45% (n=98) as male. The mean age of the participants was 42.8 (SD=9.5) with a range of 20-67. The majority of the participants were married (77.5%), while 14.2% were single and 8.3% were widowed. Most of the sample lived the majority of their lives in three big cities, namely Istanbul, Ankara or İzmir (82.1%). The average number of years of residence in İstanbul was 25.5 (SD=15). Considering the work status, fifty-five percent of the sample was employed. Of the sample 14.7% were housewives and 8% were retired. The mean number of years of education of the whole sample was 12.8 with a range of 0-21. Considering having a child living at home, 79% of the participants reported having a child in their homes. Only 2.3% of homeowners gained under 500 YTL for a month, 23.9% of the participants gained between 500 YTL and 1000 YTL, 38.1% of the participants gained between 1000 YTL and 2000 YTL and 34.9% of the participants gained over 2000 YTL. There were participants from all 32 districts of İstanbul in the

sample (see Appendix 3). The socio-demographic characteristics of the sample are given in Table 2.

Table 2. Socio-demoghraphic Characteristics of the Sample

		N	Percentage	Mean	S.d.	Range
Age				42.8	9.5	20-67
Sex	Female	120	55			
	Male	98	45			
Marital Status	Married	169	77.5			
	Single	31	14.2			
	Wid./Sep.	18	8.3			
Education in years				12.8	3.41	0-21
Employed	Yes	120	55			
	No	98	45			
Having Children living at home	Yes	172	78.9			
	No	46	21.1			
Income	<500YTL.	7	2.3			
	500-1000YTL	52	23.9			
	1000.-2000Ytl	83	38.1			
	>2000 YTL.	76	34.9			
Earthquake Experience	Yes	121	55.5			
	No	97	44.5			
Years living in İstanbul				25.5	15	.5-63
Living Place for most of their lives	Village	3	1.4			
	Town	5	2.3			
	City	31	14.2			
	Metropol	179	82.1			

2.2. Instruments

Data were collected by a questionnaire consisting of three parts (see Appendix 1). The first part was a socio-demographic information form. This form was prepared by the investigator in order to obtain information about socio-demographic characteristics of the sample such as gender, age, level of education, income, marital status, household members, place of residence in İstanbul, perceived features of their house (strength, age), employment and work status.

The second part of the questionnaire included sets of items designed to examine past earthquake experience, the severity of past earthquake experience, perceptions of the severity of a possible future earthquake, probability of occurence of a future earthquake, reasons to prepare and responsibility related to preparedness.

In order to assess past earthquake experience, one item dealt with 17 August Marmara Earthquake by asking respondents “during the 1999 Marmara Earthquake were you in the earthquake zone” (1=no; 2=yes), and if the answer is yes, “in which town”. Another item dealt with earthquake experience before the 17 August “have you experienced an earthquake prior to the 1999 Marmara Earthquake” (1=no; 2=yes), and if the answer is yes, “when and in which town”. To assess severity of past earthquake experience 5 questions, which were related to the impact of previous earthquakes on economical, emotional, health and loss of life aspects were asked.

There were 2 items focusing on the perceptions of the severity of a possible future earthquake: “Could an earthquake in İstanbul damage to life (to property) in your family” rated on a five point scale, ranging from “1-definitely will happen” to “5-definitely will not happen”. Two items assessed the perceived probability of occurence of a future earthquake: “Do you think that there will be an earthquake in İstanbul” and “if you anticipate an earthquake, when can a damaging earthquake occur in İstanbul” rated on five point scale, ranging from “1-can happen immediately” to “5-in the next twenty year”.

In order to examine the perceived responsibility for different actors related to preparedness, one item “What do you believe were the responsibilities of individuals, state, municipality and non-governmental organizations in taking precautions to reduce the damages of a possible earthquakes, how would you rate them” was presented. This item was rated on a five point scale from “5-completely responsible” to “1-not responsible at all”. One score was provided from the mean scores of reesponsibility of state, municipality and non-governmental organizations and this score was labeled as others’ responsibility. Another score was taken from the score of responsibility of individuals and it was labeled as self responsibility. Thus, two variables were determined as others’ responsibility and self responsibility.

In order to understand the reasons for preparedness and to examine distress related to possible future earthquakes two items were presented: “Do you feel prepared against a coming earthquake” (1=no; 2=yes) and “If you have taken precautions, did taking

precautions reduce psychological distress related to a possible earthquake" (5-point scale, ranging from 1-completely decreased to 5-completely increased).

The third part of the questionnaire consisted of four scales. These scales were Ways of Coping Inventory (WCI) assessing coping strategies in stressful situations, Impact of Event Scale (IES) measuring current subjective distress, trait part of the State-Trait Anxiety Inventory (STAI) to measure the level of trait anxiety of persons and Revised and Translated Mulilis- Lippa Earthquake Preparedness Scale (MLEPS) to measure the earthquake preparedness behavior. The details of these scales are given in the following section.

2.2.1.The Ways of Coping Questionnaire

The Ways of Coping Questionnaire (WCQ) was designed by Lazarus and Folkman in 1985 to examine a broad array of cognitive and behavioral strategies that people engage in when they are in diverse stressful contexts. To determine their coping strategies participants make a rating on a Likert scale to indicate whether they used each of the responses in a given stressful encounter (never=1 to all the time=4). WCQ was developed to examine the behavioral and cognitive coping styles which people use at the time of stressful situations.

Initially WCQ had 66 items with a yes-no response format. Folkman and Lazarus revised the 66-item measure, and changed the response format from yes-no to a 4-point Likert scale, ranging from "0=not used" and "2= used a great deal". In the scoring,

individuals respond the each item on a 4-point likert scale and the responses are differentially weighted according to the factor loadings.

As a result of factor analysis conducted with data obtained from a university student sample at three different times during the encounter with college examination, eight subscales and their average reliabilities were reported as follows: Problem-focused coping (r=.85), wishful thinking (r=.84), distancing (r=.71), seeking social support (r=.81), emphasizing the positive (r=.65), self-blame (r=.75), tension-reduction (r=.56), and self-isolation (r=.65). Fourteen items did not clearly load on any one factor and they were deleted, so at the final analysis there were 42 items (Folkman & Lazarus 1985).

Bouchard, Sabaurin, Kussier, Wright and Richer (1997) used WCQ in their study with 506 couples to test the structural validity of WCQ and tested both the four-factor model and the eight-factor model. According to the results, the four-factor model, problem-focused, denial, distancing/avoidance and seeking social support, was a better approximation of the WCQ data than the eight-factor model.

The WCQ has been translated and adapted into Turkish by adding eight new items which were thought to be relevant for tapping superstition and fatalism by Siva in 1988 (as cited in Ucman, 1990). In the adaptation study of this new instrument, consisting of 74 items, Siva found the internal consistency of the whole scale to be .91. Eight subscales were obtained as a result of factor analysis: planful problem solving, escape/avoidance, emotional control, growth, fatalistic approach, helplessness, self-blame and seeking refuge in supernatural forces.

Şahin and Durak (1995) administered the scale to the sample of a Turkish university students and reported a five factors solution for the scale. They included 30 items of the WCQ and reported their average reliabilities as self confident (r=.80), optimistic (r=.68), helpless (r=.73), submissive styles (r=.70), and seeking social support (r=.47).

Karancı and her colleagues (1999) used WCQ in a study after the 1995 Dinar Earthquake. In this study they examined the relationship between psychological distress and coping strategies of the 1995 Dinar earthquake survivors. The translated WCQ was reduced from 74 items to 61 items on the basis of suitability for post-earthquake coping by two experienced judges. The scale was examined in a pilot study and due to the results of the pilot study, a sixty one item form of WCI, using a three-point scale (1=never, 2=sometimes, 3=always) was used. One item was deleted because of the difficulty in comprehension and eleven items were excluded due to not meeting the criterion . According to factor analysis they reported five factors with a total of 49 items. Five subscales and their Cronbach's alpha reliabilities were reported as follows: problem solving (r=.75), fatalistic approach (r=.78), helplessness approach (r=.69), seeking social support (r=.59) and escape (r=.39). Cronbach alpha reliability of the whole scale which consisted of fourty-nine items was found to be .76 and the inter-correlations of the subscales varied between .51 and .78.

WCQ was used in a study which investigated gender differences in distress levels, coping strategies and stress related growth and factors associated with psychological

distress and perceived growth following the 1999 Marmara Earthquake (Güneş, 2001). According to the findings of this study, 4 factors were found. These were: problem solving/optimistic (r=.83), fatalistic approach (r=.77), helplessness approach (r=.73) and escape (r=.55). Cronbach alpha reliability of the whole scale was found to be .78. Seven items were excluded from the scale in order to empower the factor structure and so the whole scale consisted of 42 items.

In the current study the 42 items were used. Participants were asked to rate the frequency of using these coping strategies they used to overcome the difficulties and distress related to the 1999 earthquake using a three point scale (1=never, 2=sometimes and 3=always). The psychometric properties, such as the factor structure and the reliability coefficients of the factors will be presented in the result section.

2.2.2. Impact of Event Scale (IES)

The Impact of Event Scale (IES; Horowitz, Wilner, & Alvarez, 1979) was used to measure current subjective distress including intrusion and avoidance, which are commonly reported experiences following stressful life events. Items of intrusion of IES refers to cognitive and affective aspects of responding to a traumatic event, such as unwanted thoughts and troubling dreams. The subscale of avoidance items reflect the tendencies to avoid any reminders of a traumatic event such as feelings, ideas and situations. It is a 15-item scale. These items describe episodes of distress by people who experienced a traumatic life event. Respondents are asked to rate the items on a 4-point

scale (1-not at all, 2-rarely, 3-sometimes and 4-often) based on how often each has occured in the last 7 days. Avoidance was evaluated by 8 items which refer to avoidance of any reminders of trauma and intrusion was evaluated by 7 items which refer to emotional and cognitive symptoms of traumatic events. The total score can have a range of 0 to 75, intrusion subscale can have range of 0-35 with 7 items and avoidance subscale can have a range of 0-40 with 8 items.

The IES, was initially given to a sample of 66 patients with "stress response syndrome" attending an outpatient clinic by Horowitz et al. (1979). Horowitz reported the Cronbach's alpha as .79 for intrusion subscale and .82 for avoidance subscale. The split half reliability of the total scale was found to be .86. The test-retest reliability of IES subscales was also found to be high (r=.89 for intrusion, r=.79 for avoidance and r=.87 for total scale). The correlation between subscales was .42.

In other studies IES had acceptable reliability. Robbins and Hunt (1996) in their study administered the IES to Second World War veterans and found the internal reliability of intrusion to be .86 and avoidance as .73. Kopel and Friedman (1997) in their study with South African police found the internal reliability of intrusion to be .79, avoidance as .69 and total IES as .79. In another study IES was administered three times to survivors of terrorist attack and internal reliability of total IES was found at each time to be .78, .73, .88, respectively (Shalev, 1992).

Shalev et al. (1997) examined IES and Structured Clinical Interview, which is widely used to measure to PTSD, in terms of their predictive values of symptomatology and it was revealed that there are no differences between these questionnaires and both of them were effective in terms of predicting posttraumatic symptoms. Therefore, findings of this study showed that IES correlated well with other PTSD measures and it is a valid scale.

The IES which is one of the earliest and most useful self-report measures of posttraumatic stress is widely used in trauma research. The IES has been used to assess avoidance and intrusion in a variety of trauma exposed populations including earthquake survivors (Carr et al., 1997a; Carr et al., 1997b; Manuel & Anderson, 1993), assault victims (e.g. Elliott & Briere, 1995), urban fire fighters (Beaton, Murphy, Johnson, Pike & Corneil, 1999), motor vehicle accident survivors (Bryant & Harvey, 1996) and tornado and flood victims (Steinglass & Gerrity, 1990).

The Turkish adaptation of IES has been done in a study which investigated gender differences in distress levels, coping strategies and stress related growth and factors associated with psychological distress and perceived growth following the 1999 Marmara Earthquake survivors (Güneş, 2001). The scale was firstly translated into Turkish by two psychology professors and one clinical psychologist and this translated scale was evaluated by two psychiatrists through chosing the best fitting translation for each item. Factor analysis of IES gave two subscales, called intrusion, which included 9 items and avoidance, which included 4 items. The reliability of intrusion and avoidance subscales was found to be .78 and .68, respectively. The reliability of the whole scale

was found to be .75, and also the correlations among the subscales and the whole scale were found to be significant.

In the present study, the translated and adapted form of IES, described above, was used. Respondents were instructed to rate the frequency with which they may have experienced a given item/symptom within the past 7 days, on a marked 1 (never), 2 (sometimes) and 3 (always). The question style of the original form of the scale was "due to the event", but in this study it was changed to "due to the earthquake". The total score was used as a measure of the level of the psychological distress related to earthquakes. In the result section, the psychometric properties and factor analysis of IES will be presented.

2.2.3. State-Trait Anxiety Inventory (STAI)

STAI is a 40-item self-report scale with. Spielberger, Gorsuch and Lushene (1970) designed the scale, which has two parts, as state and trait anxiety inventories. Each part has 20 items. The goal of the scale is to measure the level of state (situational) and trait (continual) anxiety of persons who have psychological problems and also normal individuals (Öner, 1977). In the trait part, by asking "how do you feel in general" the trait anxiety of subjects are evaluated on a four-point scale (1=almost never, 2=sometimes, 3=mostly and 4=almost always).

The test-retest reliability of the scale ranged from .16 to .54 for state anxiety inventory and from .73 to .86 for trait anxiety inventory. The internal consistency of the first part varied between .83 and .92, and between .86 and .92 for second part. Construct and criterion validity values were reported to be good (Spielberger, Gorsuch and Lushene, 1970).

State-Trait Anxiety Inventory (STAI) ws translated and adapted to Turkish by Öner and Le Comte in 1985. Öner and Le Comte (1985) performed adaptation study of STAI by using both a normal sample and a sample of psychiatric patients. Test-retest reliability was found to be between .71 and .86 for trait anxiety inventory, between .26 and .68 for state anxiety inventory. Internal consistency of trait anxiety inventory ranged from .83 to .87, while that of state anxiety inventory ranged from .94 to .96. Criterion and construct validity was demonstrated to be satisfactory and consistent with the original measurement of Spielberger, Gorsuch and Lushene in 1970.

In the present study, only trait anxiety inventory, composed of 20 items, was given to the participants, in order to control the effect of continual anxiety of participants on earthquake prepredness.

2.2.4. Revised and Translated Mulilis- Lippa Earthquake Preparedness Scale (MLEPS)

The original form of MLEPS is a multi act scale for measuring earthquake preparedness of individuals and the perceived difficulty of becoming prepared for earthquakes. It is a self-report scale with 27 earthquake preparedness items (e.g., "Do you have a 4-day supply of dehydrated or canned food?", "Does your household have earthquake insurance?") designed by Mulilis and Lippa in 1985. Each item is rated as "yes" (3 points), "unsure" (2 points) and "no" (1 point). Subjects were also asked to rate the difficulty of preparing for each item on a 5-point scale, from 1:not at all difficult to 5:extremely difficult (Mulilis and Lippa, 1985).

The scale is a behavioural measure, assessing individual behavioural involvement in earthquake preparedness. The 27 items represent all standard suggestions appearing in earthquake preparedness brochures and books that are specifically and clearly related to earthquake preparedness. In addition to assessing the degree of preparedness, the scale was also designed to obtain ratings of the perceived difficulty of obtaining or performing each item in the scale.

Mulilis and Lippa (1988) examined the psychometric properties of MLEPS using four different groups. According to the results, the reliability coefficients reached acceptable levels ranging from .68 to .97 for the preparedness items and .84 to .94 for the perceived difficulty measure. Test-retest reliability was examined using two groups of four. Results

showed that it reached acceptable levels of significance for preparedness ($r=.68$, $p<.001$) and perceived difficulty ($r=.64$, $p<.001$) for group 1 and levels for preparedness ($r=.78$, $p<.001$) and perceived difficulty ($r=.61$, $p<.001$) with regard to group 2. Therefore , it can be concluded that the scale exhibits reasonable levels of stability over time. Furthermore authors argued that, the internal reliability of this particular type of scale is not an issue because being prepared on some of the items does not necessarily imply being prepared on other items (Mulilis & Lippa 1988).

In the present study, some changes were made to the original MLEPS scale in order to adopt it to Turkish culture. Five items were added, based on experts' replies to a questionnairre administered in the "Disaster Management of Turkey: Sixth Roundtable Meeting" in 2003 and four items were deleted, because they were not suitable for the Turkish culture. The added items were:

1. Do you have emergency telephone numbers list in a easily reachable place.
2. Does your household have a meeting place to come together after a possible earthquake.
3. During a possible earthquake, have your household planned a safe place to hide.
4. Have you attended a first aid course.
5. Have the officials made the control of the seismic resistance of your building.

The deleted items were:

1. Do you have the knowledge of the location of an emergency broadcasting station on your radio dial?
2. Do you have wrenches necessary to operate utility shut-off vaves and writches?
3. Do you vote on bills dealing with earthquake resistant buildings?

In the current study, preparedness was examined in five categories, namely supply, utilities, stabilization, planning and knowledge.

In the original scale subjects were asked to rate the difficulty of preparing for each item to measure the variable of self-efficacy on a 5-point scale, from 1: not at all difficult to 5:extremely difficult. In the present study subjects were also asked to rate the perceived effectiveness of preparing for each item in order to measure the variable of outcome efficacy and participants rated both difficulty and effectiveness of preparing on 3 point scales (1=not at all, 2=a little, 3=very much) instead of a 5-point scale, for ease of comprehension.

2.3.Procedure

To examine the predictors of earthquake preparedness, 218 adults from different parts of Istanbul, which is under the high risk of a possible earthquake, were the participants of the study. Certain sample selection criteria were followed to obtain sampling from different areas of Istanbul. Participants from different parts of Istanbul and from different levels of socio-economic status must come together in the place, where the

research questionnaire as administered. For this purpose, initially two departments of Istanbul Technical University, which were architecture and civil engineering, the Psychology Department of Middle East Technical University and a high school called Kabatas Erkek Lisesi were determined. Then to provide a better distribution of socio-economic status of participants, the research questionnaire was administered in a secondary school called Istanbul Bahcelievler Ilkogretim Okulu.

In the randomly selected classrooms of these schools, the researcher explained that he was conducting an investigation of earthquake preparedness and asked the students who want to be volunteer in the study to take a questionnaire to be filled in their mother or father and then return it to the school. They were told that the task was completely voluntary. It was also emphasized that they were free to discontinue responding whenever they want. If they accepted the invitation to join, volunteer students were invited for a thirty-minute brief training about filling the questionnaire.

After the brief explanation of filling out the questionnaire, if the volunteers accepted to participate the research , the experimenter gave him/her the questionnaire to be completed by one of his/her parents and return it to the school. The students administered the research questionnaire to their fathers or mothers individually and the procedure was applied as a structured interview. Responses were marked by the students. The administration of each questionnaire took approximately 45 minutes. Only one person from each household was interviewed. The response rate was 58.1%. Data were collected in two months.

CHAPTER 3

RESULTS

3.1. Data Screening and Analysis

In the current study, data obtained from 218 adults from different parts of Istanbul, which is under high risk of a possible earthquake were analyzed. Before the analysis all data were examined through various programs of Statistical Package for Social Sciences (SPSS) for the accuracy of data. To reduce the extreme kurtosis and skewness, z scores for all variables were computed and no case was found to have extremely low or high z scores.

Prior to the main analysis, factor analysis was performed for the Impact of Event Scale (IES) and Ways of Coping Inventory (WCI) and their factor structure were examined. Reliability analysis was conducted for the Revised and Translated Mulilis- Lippa Earthquake Preparedness Scale (MLEPS), Impact of Event Scale (IES) and Ways of Coping Inventory (WCI). Finally, the predictors of earthquake preparedness behavior were examined through hierarchical multiple regression analysis.

3.1.1. Factor Analysis of Ways of Coping Inventory (WCI)

The responses to the 42 items of WCI were subjected to factor analysis using principal component analysis (PCA) with varimax rotation. Initially, employing an eigenvalue of 1.00 as the criterion yielded 12 factors which explained 62.5% of the variance was obtained. With the use of scree plot and further analysis, with restrictions on the number of factors, a four-factor solution explaining 38.6 % of the total variance produced the clearest result. A factor loading of .40 was taken as the criterion to determine the item compositions of the 4 factors. Each item was included under the factor on which it had the highest loading. Six items did not meet the criterion and were excluded from further analysis. Since item 5 and 32 negatively loaded, they were reversed prior to summing to get the mean factor scores, which were obtained by summing up the responses given to the items of the factors and by dividing them by the number of items in each factor.

Sixteen items loaded on the first factor which was labeled as "problem solving/optimistic coping". Cronbach's alpha reliability coefficient for internal consistency of this subscale was found to be .87. Ten items loaded on the second factor which was labeled as "fatalistic approach" and its Cronbach's alpha reliability coefficient was found to be .87. Seven items loaded on the third factor which was labeled as "helplessness/self-blaming approach" and Cronbach's alpha reliability coefficient was found to be .67. Three items loaded on the fourth factor which was

labeled as “seeking social support”. Cronbach’s alpha reliability coefficient for internal consistency of this subscale was found to be .49. The internal consistency of the whole scale was found to be .77.

Table 3 presents the item compositions of four factors. the factor loadings of each item and Cronbach’s alpha reliability coefficients of the factors.

Table 3. Item Composition of the WCI factors, their factor loadings, percentage of explained variance and Cronbach Alpha Values

Factors and Items	Factor Loadings			
	Factor 1	**Factor 2**	**Factor 3**	**Factor 4**
Factor: 1 Problem solving/optimistic coping α= .87 Explained Variance= 13.47 %				
39. I inspire to do something creative about the problem	**.70**	.02	.14	-.04
31. I make a plan of action and follow it	**.67**	-.20	.01	-.11
19. I know what have to be done, so I double my effort to make things work	**.64**	-.10	-.20	.16
28. I just concentrate on what I have to do next	**.63**	.06	-.02	-.01
25. I come out of with couple of different solutions the problem	**.63**	-.05	.06	.11
22. I stand my ground and fight for what I wanted	**.63**	-.20	-.24	-.11
38. I try not to act very hastily or follow my first hunch	**.62**	.10	.01	.02
23. I bargain or compromise to get something positive from the situation.	**.62**	.03	-.26	.01
41. I try to be assertive and defend my right	**.53**	-.12	.05	.08
42. I change or grow as a person	**.53**	.02	-.02	-.14
27. I try to adopt a new perspective	**.51**	-.02	-.13	.14
8. I maintain pride and keep a stiff upper lip	**.51**	-.08	-.47	.05
7. I try to analyze the problem in order to understand it better	**.47**	-.01	-.20	.20
32. I quit fighting	**-.47**	-.20	-.07	-.07
3. I try to look on the bright side of things	**.46**	.27	-.28	.26

11. I try to understand the seriousness of the situation	**.41**	-.11	-.14	.12
Factor 2: Fatalistic Approach				
α= .87 Explained Variance= 12.82 %				
37. I believe that God knows the best	-.09	**.80**	.13	-.04
24. I think that it is my destiny and it does not change	-.13	**.75**	.23	-.02
15. I pray for help	.06	**.74**	.06	-.01
34. I think what happens is my fate	-.22	**.71**	.26	-.07
14. I think that everything in life has a positive side	.05	**.70**	-.04	.12
10. I go along with fate; sometimes I just have bad luck	-.12	**.69**	.03	-.04
20. I think that it depends on how it develops	-.09	**.64**	.13	-.09
16. I try to be happy with what I have	.17	**.62**	-.26	.03
30. I give money to poor people to escape my trouble	-.11	**.57**	.17	.04
2. I hope for a miracle	-.11	**.41**	.27	.32
Factor 3: Helplessness/Self Blaming Approach				
α= .67 Explained Variance= 8 %				
17. I can not help thinking about the problem	-.11	.14	**.57**	.17
12. I feel helpless	-.06	.24	**.56**	-.01
40. I realize that I bring the problem on myself	-.09	.07	**.56**	.07
5. I make light of the situation; I refuse to get too serious about it	-.02	-.16	**-.52**	-.32
36. I do not understand my fault	-.14	.40	**.48**	.12
33. I think that I make the problems	.04	.07	**.46**	-.14
35. I think if only I were stronger	-.11	.35	**.46**	.19
Factor 4: Seeking Social Support				
α= .49 Explained Variance= 4.47 %				
4. I expect others to help me in solving my problems	-.17	.02	.23	**.69**
18. I express anger to the person(s) who cause the problem	.21	-.03	-.10	**.59**
21. I ask friends before I make and action	.06	-.10	.06	**.45**
α= .80 Total Explained Variance= 38.72%				
Excluded Items				
1. I turn to work or another activity to take my mind off	.13	.11	-.03	.19
9.I try to forget the whole thing	.18	.31	-.37	.27
26. I wish that I can change what has happened	.08	.32	.36	.27
6. I try to think calmly and not get angry	.28	-.04	-.37	.22
29. I accept the next best thing to what I want	.16	.10	.14	.03
13. I expect understanding from people to whom I express my feelings	-.04	-.01	.30	.17

In order to examine the inter correlations among the factors, Pearson product-moment correlation coefficients were computed. As can be seen from the Table 3 problem solving/optimistic approach was significantly and negatively correlated with helplessness/self-blaming approach and fatalistic approach. Fatalistic approach was positively correlated with helplessness/self-blaming approach. With regards to preparedness, problem solving/optimistic approach was significantly and positively, on the other hand helplessness/self-blaming approach and fatalistic approach was significantly and negatively correlated with earthquake preparedness behavior.

Table 4. Mean Values and Pearson Correlations Among Subscales of WCI and Preparedness

	M	1	2	3	4	5
1. Problem Solving / Optimistic	2.62		-.158*	.-308**	.-102	.307**
2. Fatalistic Approach	1.88			.383**	.034	-.163**
3. Helplessness / Self-Blaming	1.76				.028	-.221**
4. Seeking Social Support	2.10					.059
5. Preparedness						

* p< .05 level ; ** p<.01

3.1.2.Factor Structure of the Impact of Event Scale (IES)

The factor structure of IES was examined by principal component analysis (PCA) with varimax rotation. The initial analysis, employing an eigenvalue of 1.00 as the criterion resulted in 4 factors explaining 59% of the variance. Further analysis with restrictions on the number of factors suggested that a 2-factor solution explaining 46% of the total variance, produced the clearest solution. A factor loading of .40 was employed as the criterion to determine the item composition of the factors. One item did not meet the criterion and were excluded from further analysis. This item were under avoidance subset in the original scale. The remaining 14 items were included under the factor in which they had a higher loading. Eight items loaded on the first factor, labeled as "intrusion". Cronbach's alpha reliability coefficient for internal consistency of the intrusion subscale was found to be .85. Six items loaded on the second factor labeled as "avoidance". Cronbach's alpha reliability coefficient for internal consistency of the avoidance subscale was found to be .74. The item composition of the factors, the factor loadings of the each item and Cronbach's alpha reliability coefficients of the factors were presented in Table 2. The internal consistency of the whole scale was found to be .80.

Table 2. Item Composition of the Two IES factors, Their Factor Loadings, Percentage of Explained Variance and Cronbach Alpha Values

Item no Item Factors and Items	Factor Loadings Factor 1	 Factor 2
Factor: 1 Intrusion **α= .85 Explained Variance= 29.34 %**		
5. I had waves of strong feelings about earthquake	**.75**	.15
4. I had troubled falling asleep because of the pictures or thought about earthquake	**.75**	.04
6. I had dreams about the earthquake	**.75**	.04
14. Any reminder brought feelings about the earthquake	**.74**	.04
1. I thought about the earthquake when I didn't mean to	**.70**	.02
10. Picture about the earthquake popped into my mind	**.66**	.02
11. Other things kept making me think about earthquake	**.65**	.02
12. I was aware that I still had a lot of feelings about the earthquake, but I didn't face it	**.55**	.19
Factor:2 Avoidance **α= .74 Explained Variance= 15.24 %**		
13. I tried not think about the earthquake	.19	**.76**
9. I tried not to talk about the earthquake	.09	**.75**
3. I tried to remove the earthquake from my memory	.21	**.62**
7. I stayed away from reminders of the earthquake	.32	**.62**
8. I felt as if it didn't happen	-.11	**.60**
15. My feelings about the earthquake were kind of numb	-.08	**.52**
Items Excluded		
2. I avoided letting myself get upset	.00	.13

In order to examine inter-correlations among the subscales as well as the correlations between the subscales and the whole scale, Pearson product-moment correlation coefficient were computed. The correlations among the whole and subscales were found to be significant. The results are presented in table 3.

Table 6. Mean Values and Pearson Correlations Among Subscales of IES and Preparedness

	M	1	2	3	4
1. Impact of Event	2.25		.830**	.731**	-.10
2. Intrusion	2.38			.246**	-.124
3. Avoidance	2.12				-.038
4. Preparedness					

** p<.01

3.1.3.Reliability Analysis of Revised and Translated Mulilis Lippa Earthquake Preparedness Scale (Mulilis- Lippa Earthquake Preparedness Scale)

Possible earthquake preparedness items, as given responses to the revised MLEPS, the perception of difficulties for performing each item and the effectiveness rating for each item were grouped into 5 categories. These were supply (such as having flashlight), utilities (such as knowing how to operate water shut), stabilization (such as stabilization of water heaters), earthquake planning (such as identifying a meeting place) and knowledge (such as reading the materials about earthquake preparedness). Therefore 15 different scores were obtained as shown in Table 7.

Table 7. Means, Standard Deviations and Cronbach's Alpha Reliability Coefficients of Revised MLEPS Categories

	PREPAREDNESS	*DIFFICULTY*	*EFFECTIVENESS*
SUPPLY	1.65_{e} (sd:.53 α:.78)	1.36_{c} (sd:.42 α:.89)	2.61_{b} (sd:.47 α:.91)
UTILITIES	2.80_{a} (sd:.42 α:.84)	1.14_{d} (sd:.30 α:.87)	2.73_{a} (sd:.35 α:.85)
STABILIZATION	1.76_{d} (sd.68 α:.74)	1.79_{a} (sd:.60 α:.88)	2.64_{b} (sd:.46 α:.89)
PLANNING	1.89_{c} (sd:.81 α:.64)	1.35_{c} (sd:.56 α:.78)	2.64_{b} (sd:.54 α:.73)
KNOWLEDGE	2.23_{b} (sd:.40α:.49)	1.54_{b} (sd:.40 α:.74)	2.68_{ab} (sd:.41 α:.83)

*The mean scores that don't share the same subscript on the same column are significantly different from each other at .05 alpha level.

Considering the five categories (supply, utilities, stabilization, planning and knoeledge), one-way repeated measures ANOVAs were conducted for Preparedness, Difficulty, and Effectiveness measures seperately. The results were all significant, such that for preparedness, $F(4, 868)=188.857$, $p<.000$, for difficulty $F(4, 868)=89.567$, $p<.000$ and for efficacy $F(4, 868)=4.868$, $p<.000$. Table 7, presents the means and the results of post-hoc analysis for each measure. The results of post-hoc comparisons by using Tukey-HSD indicated that, all preparedness subcategories were significantly different from each other in the given order; utilities (M=2.80), knowledge (M=2.23), planning (M=1.89), stabilization (M=1.76) and supply (M=1.65). Considering perceived difficulty for preparation, apart from supply (M=1.36) and planning (M=1.35), all subcategories were significantly different from each other with the order of stabilization (M=1.79), knowledge (M=1.54) and utilities (M=1.14). There were no significant difference between knowledge (M=2.68), stabilization (M=2.64) and planning (M=2.64)

subcategories with respect to perceived effectiveness of preparation and the mean scores of utilities (M=2.73) was significantly higher than the mean scores of supply (M=2.61). Mean scores of utilities subcategory were significantly higher than the mean scores of all other subcategories with respect to preparedness and perceived effectiveness and significantly lower than others with respect to perceived difficulty.

Cronbach's alpha reliability coefficient for the internal consistency of the whole earthquake preparedness scale was found to be .84, the internal consistency of the whole perceived difficulty of becoming prepared scale was found to be .90 and the internal consistency of the whole perceived effectiveness of becoming prepared scale was found to be .94.

In order to examine the inter correlations among three different parts of the whole scale (preparedness, perceived difficulty of becoming prepared [ie. self efficacy] and perceived effectiveness of becoming prepared [ie. outcome efficacy]), Pearson product-moment correlation coefficients were computed for all categories. Self-efficacy and outcome efficacy was positively correlated with earthquake preparedness in all categories. According to these results perceived difficulty of becoming prepared for earthquakes was negatively and perceived effectiveness of becoming prepared for earthquakes was positively correlated with earthquake preparedness behavior, as consistent with "person relative to event model".

Items of the five categories, their means, their Cronbach's alpha reliability coefficient for internal consistencies, and inter correlations among three different parts of the whole scale for all categories to be as follows:

Table 8: Means and Standard Deviations for Supply Items

Supply Items	Preparedness α=.78; M=1,65	Difficulty α=.89; M=1,36	Effectiveness α=.91; M=2,61
a) An operating flashlight	M: 2.21 Sd:.97	M:1.13 Sd:.40	M:2.71 Sd:.55
b) Extra batteries for the flashlight	M: 1.58 Sd:.87	M:1.20 Sd:.46	M:2.56 Sd:.64
c) An operating transistor radio	M: 1.61 Sd:.92	M:1.27 Sd:.53	M:2.53 Sd:.65
d) Extra batteries for the transistor radio	M: 1.40 Sd:.78	M:1.28 Sd:.53	M:2.46 Sd:.69
e) A complete first-aid kit	M: 1.70 Sd:.94	Mean:1.41 Sd:.59	Mean:2.74 Sd:.52
f) At least 4 gallons of water in plastic containers	M: 1.62 Sd:.92	M:1.33 Sd:.60	M:2.66 Sd:.61
g) At least 4 days supply of dehydrated or canned food	M: 1.41 Sd:.79	M:1.52 Sd:.68	M:2.58 Sd:.65
h) An operating fire extinguisher	M: 1.28 Sd:.68	M:1.83 Sd:.76	M:2.55 Sd:.61
i) Do you have emergency telephone number list in a easily reachable place	M: 2.01 Sd:.99	M:1.24 Sd:.53	M:2.67 Sd:.59

Table 9. Pearson Correlations Among Three Supply Parts of Revised MLEPS

	1	2	3
1. SUPPLY PREPAREDNESS		-.254**	.270**
2. SUPPLY DIFFICULTY			-.553**
3. SUPPLY EFFECTIVENESS			

** p<.01

Table 10: Means and Standard Deviations for Utilities Items

Utilities Items	Preparedness α=.84; M=2,80	Difficulty α=.87; M=1,14	Effectiveness α=.85; M=2,73
a) Location of the water shut	M: 2.90 Sd:.43	M:1.11 Sd:.35	M:2.75 Sd:.47
b) Location of the gas shut	M: 2.60 Sd:.78	M:1.20 Sd:.48	M:2.81 Sd:.44
c) Location of the electric power shut	M: 2.93 Sd:.35	M:1.09 Sd:.33	M:2.38 Sd:.36
d) How to operate water shut	M: 2.85 Sd:.50	M:1.10 Sd:.32	M:2.60 Sd:.53
e) How to operate gas shut	M: 2.62 Sd:.75	M:1.22 Sd:.48	M:2.65 Sd:.52
f) How to operate electric power shut	M: 2.90 Sd:.43	M:1.10 Sd:.33	M:2.70 Sd:.49

Table 11. Pearson Correlations Among Three Utilization Parts of Revised MLEPS

	1	2	3
1. UTILITIES PREPAREDNESS		-.419**	.322**
2. UTILITIES DIFFICULTY			-.292**
3. UTILITIES EFFECTIVENESS			

** p<.01

Table 12: Means and Standard Deviations for Stabilization Items

Stabilization Items	Preparedness α=.74; M=1,76	Difficulty α=.88; M=1,79	Effectiveness α=.89; M=2,64
a. Water heaters	M: 2.22 Sd:.95	M:1.64 Sd:.68	M:2.62 Sd:.53
b. Cupboards	M: 1.66 Sd:.92	M:1.90 Sd:.72	M:2.70 Sd:.52
c. Tall furniture	M: 1.49 Sd:.83	M:1.94 Sd:.73	M:2.62 Sd:.55
d. Heavy objects placed high on walls	M: 1.69 Sd:.93	M:1.68 Sd:.65	M:2.63 Sd:.56

Table 13. Pearson Correlations Among Three Stabilization Parts of Revised MLEPS

	1	2	3
1. STABILIZATION PREPAREDNESS		-.494**	.349**
2. STABILIZATION DIFFICULTY			-.467**
3. STABILIZATION EFFECTIVENESS			

** p<.01

Table 14: Means and Standard Deviations for Planning Items

Planning Items	Preparedness α=.64; M=1,89	Difficulty α=.78; M=1,35	Effectiveness α=.73; M=2,64
a) Does your household have a meeting place to come together after a possible earthquake.	M: 1.66 Sd:.92	M:1.38 Sd:.64	M:2.56 Sd:.66
b) During a possible earthquake, does your household have a plan for a safe place.	M: 2.12 Sd:.97	M:1.32 Sd:.61	M:2.71 Sd:.55

Table 15. Pearson Correlations Among Three Earthquake Planning Parts of Revised MLEPS

	1	2	3
1. PLANNING PREPAREDNESS		-.253**	.294**
2. PLANNING DIFFICULTY			-.368**
3. PLANNING EFFECTIVENESS			

** p<.01

Table 16: Means and Standard Deviations for Knowledge Items

Knowledge Items	Preparedness α=.49; M=2,23	Difficulty α=.74; M=1,54	Effectiveness α=.83; M=2,68
A. Do you know the location of a medical emergency center in your neighborhood	M: 2.95 Sd:.25	M:1.14 Sd:.41	M:2.81 Sd:.48
B. Do you read material on earthquake preparedness	M: 2.66 Sd:.74	M:1.20 Sd:.48	M:2.65 Sd:.58
C. Do you attentively listen to or watch radio or television messages about earthquake preparedness	M: 2.72 Sd:.64	M:1.19 Sd:.48	M:2.68 Sd:.57
D. Do you attend meetings held by schools or civic organization for the purpose of establishing earthquake preparedness	M: 1.66 Sd:.90	M:1.81 Sd:.75	M:2.59 Sd:.57
E. Does your household have earthquake preparedness insurance	M: 1.61 Sd:.91	M:1.83 Sd:.77	M:2.77 Sd:.53
F. f) Have you attended a first aid course	M: 2.13 Sd:.97	M:1.57 Sd:.72	M:2.56 Sd:.70
G. g) Have the officials made the control of resistance of your house	M: 1.90 Sd:.93	M:2.05 Sd:.76	M:2.70 Sd:.58

Table 17. Pearson Correlations Among Three Knowledge Parts of Revised MLEPS

	1	2	3
1. KNOWLEDGE PREPAREDNESS		-.502**	.392**
2. KNOWLEDGE DIFFICULTY			-.615**
3. KNOWLEDGE EFFECTIVENESS			

** $p<.01$

3.1.4.Regression Analysis: Predictors of Level of Earthquake Preparedness Behavior

Multiple regression analyses were conducted to examine how well the demographic variables, trait anxiety, past earthquake experience, impact of past experience, threat perception, self responsibility, others' responsibility, outcome efficacy, self efficacy, and four factors of coping strategies predicted earthquake preparedness. In the analysis, the first block consisted of demographic variables; which were age, gender, marital status, education, having a child living at home, and income. Predictors in the second block were trait anxiety and four coping strategies (problem focused, fatalistic, helplessness/self-blaming, seeking social support). The third block consisted of past earthquake experience, intrusion and avoidance symptom levels of impact of event scale, self responsibility, others' responsibility, probability of the occurrence of the event and perceived severity of the event. The research questionnaire had a past earthquake experience section. This section contained eight items to determine the severity of the exposure of past earthquake experience. These items were

evaluated as only one variable and added to regression analysis as an independent variable. The response format of two items was changed from 4-point to 2-point for this procedure. The responses to these 8 items were subjected to the reliability analysis. Cronbach's alpha reliability coefficient for internal consistency of these items was found to be .75. The fourth block consisted of outcome efficacy (perceived effectiveness of preparedness) and self-efficacy (perceived difficulty of preparedness). The criterion variable (DV) in this analysis was level of earthquake preparedness behavior. Table 18 presents the variables that were used as predictors of earthquake preparedness, their means, standard deviations, steps in regression and significance in earthquake preparedness. The pearson product-moment correlations among the predictor variables and criterion variables are presented in Table 19.

Table 18. Means and Standard Deviations of Criterion and Predictor Variables Entered in the Three Steps of the Analysis and Their Significance in the Last Step

	Steps	Mean	Std. Deviation	Sign.
Level of Preparedness	DV	58.11	9.72	
Age	Step 1	42.78	9.53	
Gender		1.55	.50	
Marital Status		1.22	.42	
Education		12.92	3.58	
Income (1=<500, 4=>2000)		3.05	.85	
Number of child		1.79	.41	
Trait anxiety	Step 2	41.49	7.65	
Problem-Focused Coping		2.62	.31	
Fatalistic Approach		1.88	.46	
Helplessness/Self-blaming		1.76	.35	
Seeking Social Support		2.10	.41	
Others' Responsibility	Step 3	4.57	.60	
Self Responsibility		4.57	.82	
Past Earthquake Experience		1.28	.24	Sig.
Intrusion Symptoms		2.38	.46	
Avoidance Symptoms		2.12	.49	Sig.
Probability of the Occurence		3.90	1.02	
Perceived Severity		3.67	.74	
Difficulty (Self-Efficacy)	Step 4	39.70	8.55	Sig.
Effectiveness (Outcome Efficacy)		74.47	9.73	Sig.

Table 19. Correlations Among the Criterion and Predictor Variables

	Age	Gender	Mari	Educ.	Income	Child	Anx.	Exp.	IES 1	IES 2	Sever	Dif	Eff	Ex. R	In. R	W 1	W 2	W 3	W 4
Prep.	.461**	.016	-.14*	.145*	.127	.048	-.23**	.186**	-.12	-.04	.065	-.51**	.434**	.046	.125	.307**	-.16**	.221**	.059
Age		-.067	-.45**	-.063	.005	.457**	-.008	.085	.011	-.043	-.044	.039	-.081	-.091	-.038	.048	.045	-.036	.034
Gender			-.021	-.086	.082	-.015	.066	-.011	-.071	-.089	.048	-.037	.133*	.096	.047	.136*	.106	.084	.058
Mar. St.				-.050	-.18**	-.48**	.022	-.022	.090	.047	.053	.093	-.062	-.054	-.015	-.087	-.162*	.008	-.061
Educ.					.42**	-.070	-.050	-.013	.17**	.112	.045	-.20**	.16**	-.005	.024	.096	-.25**	-.116	-.094
Income						.015	-.21**	-.007	.171**	.055	-.016	-.18**	.172**	.051	.108	.181**	-.16**	-.096	.009
Child							.043	.047	.036	.15**	-.14*	-.041	-.036	.004	-.077	.069	.118	-.022	.054
Anxiety								-.029	-.27**	-.154*	.031	.18**	-.064	-.17*	-.104	-.38**	.22**	.62**	.034
Exper.									.21**	-.035	.108	-.027	-.061	-.125	.086	-.010	.071	.046	-.001
IES 1										.25**	-.100	.033	-.055	.120	.036	.060	-.20**	-.31**	-.15*
IES 2											.018	-.024	-.036	-.009	.019	-.058	-.20**	-.108	-.040
Severity												-.024	.14*	-.065	-.019	.109	-.102	.075	.108
Diffic.													-.67**	-.14*	-.19**	-.35**	.24**	.20**	-.090
Effect.														.24**	.21**	.32**	-.096	-.093	.123
Ex. Res															.39**	.24**	-.002	-.124	-.061
In. Res																.17**	-.15*	-.072	.056
WCI 1																	-.16**	-.31**	.102
WCI 2																		.38**	.034
WCI 3																			.028

Table 20 presents the unstandardised regression coefficients, standardized regression coefficients (β), R^2 and R^2 Change after each block of the regression analysis. R was significantly different from zero at the end of each step, apart from first step. After last step, with all IV's in the equation, R=.62, F (20, 197)=6.23, p<.001.

The results indicated that the inclusion of demographic variables (R^2=.048, F (6, 211)=1.778, p<.05) was not significant. After step 2 the addition of trait anxiety and four coping strategies (problem focused, fatalistic, helplessness/self-blaming, seeking social support) (R^2=.15, F (11, 206)=3.37, p<.001) was significant. When each single variable was considered in the second block, only problem-focused coping (p<.01) were found significant. In step 3, the addition of past earthquake experience, intrusion and avoidance symptom levels of impact of event scale, self responsibility, others' responsibility, probability of the occurrence of the event and perceived severity of the event (R^2=.24, F (18, 199)=3.46, p<.001) resulted a significant increment in the equation. When each single variable was considered in the third block, problem-focused coping (p<.05), avoidance symptoms impact of event scale (p<.05), perceived probability of occurrence of the event (p<.05) and the severity of past earthquake experience (p<.05) were found to be significant. In the last step, the addition of perceived difficulty of preparedness (self-efficacy) and perceived effectiveness of preparedness (outcome-efficacy) (R^2=.39, F (20, 197)=6.23, p<.001 was significant. Therefore, in the last step, addition of all past earthquake experience, avoidance, self-efficacy and outcome-efficacy resulted in a significant increment in R^2. Using all these

factors in the model, 39% of the variance in the level of earthquake preparedness behavior was explained. When each single variable was considered in the final analysis, severity of exposure of past earthquake experience ($p<.05$), avoidance ($p<.05$), self efficacy ($p<.001$) and outcome efficacy ($p<.01$) were found to be significantly related to earthquake preparedness. While severity of exposure of past earthquake experience and outcome efficacy were found to be positively related, avoidance and perceived difficulty of preparedness were found to be negatively related to the level of earthquake preparedness behavior.

Table20: Predictors of Levels of Earthquake Preparedness Behavior

Variables	Block	R^2	R^2 Change	F Change	Sig. F cha.	B	Sign. T
	1	.048	.048	1.78	.105		
	2	.152	.104***	1.59	.000		
	3	.238	.86***	.09	.000		
	4	.387	.149***	2.77	.000		
Age						.12	.073
Gender						-.01	.853
Income						-.03	.652
Having Child						-.02	.809
Marital Status						-.03	.716
Education						.07	.300
Trait Anxiety						-.14	.088
WCI 1 (PFC)						.07	.328
WCI 2 (EFC)						-.04	.601
WCI 3 (EFC)						-.06	.444
WCI 4 (EFC)						-.02	.749
IES 1 (avoidance)						-.13	**.046**
IES 2 (intrusion)						-.04	.552
Probability						.09	.174
Severity						-.02	.729
Self Responsibility						.01	.919
Others' Responsib.						-.05	.416
Past Experience						.15	**.016**
Difficulty (Self-Efficacy)						-.27	**.001**
Effectiveness (Outcome-Efficacy)						.22	**.007**

*p<.05 ; ** p<.01 ; *** p<.001

3.1.5.Reasons for Earthquake Preparedness and Non-Preparedness

Results of the question of "according to you, have you made adequate preparations for an earthquake?" indicated that, only 19.3% of the participants answered "yes" and 80.7% of the participants answered "no". Participants who did not prepare for a possible future earthquake provided the following reasons for not preparing adequately as presented in table 21.

Table 21. Reasons of participants for not preparing

Reasons for not Preparing Adequately	*n*	*Percentages*
Neglectfullness	99	45.4
Trust in their building	65	29.8
Don't have enough money	56	25.7
Being a tenant in the building	43	19.7
Don't have enough time	36	16.5
Don't think to stay in this house for a long time:	32	14.7
Don't know what to do	30	13.8
Not possible to avoid the power and desire of God	25	11.5
No need, an earthquake will not happen	14	6.4

On the other hand, participants who prepared for a possible future earthquake provided the following reasons, given in table 22, for their preparedness.

Table 22. Reasons participants gave for being prepared

Reasons for Preparedness	*n*	*Percentages*
To provide safety for my family	146	67.0
To feel myself safe	135	61.9
Scientist's explanations	51	23.4
Don't trust the building	41	18.8
Because, my relatives prepared	5	2.3

CHAPTER 4

DISCUSSION

The aim of this study was to explore the predictive power of demographic variables, some psychological variables, namely, trait anxiety, psychological impact of past experience (avoidance and intrusion symptom levels of impact of event scale), threat perception, locus of responsibility and coping strategies (problem focused approach, fatalistic coping, helplessness/self blaming approach and seeking social support) and earthquake related variables, namely, the severity of past earthquake experience, outcome efficacy (perceived effectiveness of preparedness for reducing negative outcomes in an earthquake) and self efficacy (perceived difficulty of carrying out preparedness activities) in predicting earthquake preparedness behavior. In this chapter, the results of the analysis will be discussed. Subsequently, the importance and the limitations of the study and the possible implications of the findings will be discussed.

4.1. Earthquake Preparedness Behavior

In order to examine the factors of the level of earthquake preparedness behavior, the demographic variables, trait anxiety, the severity of past earthquake experience, outcome efficacy (perceived effectiveness of preparedness for reducing negative outcomes in an

earthquake), self efficacy (perceived difficulty of carrying out preparedness activities), psychological impact of past experience (avoidance and intrusion symptom levels of impact of event scale), threat perception, locus of control and coping strategies were studied. Perceived difficulty of being prepared (self-efficacy), perceived effectiveness of being prepared (outcome efficacy), the severity of the exposure to past earthquake experience and avoidance symptom levels of impact of event scale were found to be significant in the prediction of earthquake preparedness behavior. When the predictors of earthquake preparedness level were examined, while the severity of the exposure to past earthquake experience and outcome efficacy increases the level of earthquake preparedness behavior; perceived difficulty of being prepared, and avoidance symptom levels of impact of event scale decreases it.

The current study data supported some propositions of person relative to event model. It was predicted that, if people think that some preparation could be done to prevent loss and damage (outcome-efficacy) and believe that they themselves are capable of doing them (self-efficacy), they will engage in preventive behavior (earthquake preparedness). As an evidence to these statements, the results of the current study showed that there is a significant relationship between both self-efficacy and outcome efficacy with the level of earthquake preparedness level.

In the second and the third step of regression analysis of the current study, there was a significant positive relationship between problem-focused coping and earthquake preparedness behavior. However, this significant relationship disappeared in the last step

after the addition of self-efficacy and outcome efficacy to the equation. In order to examine individual's general coping strategies in stressful contexts, The Ways of Coping Inventory was used in this study. On the other hand, self-efficacy and outcome efficacy were measured by the earthquake-specific questions. In the last step of regression analysis, the cause of disappearing the significance of problem-focused coping on earthquake preparedness behavior might be this condition that, The Ways of Coping Inventory was general and self-efficacy and outcome-efficacy were specific measurement devices. According to Protection-Motivation Theory when a person perceives an existing threat to her/his well-being, she or he will engage in a coping strategy that is intended to decrease the impact of harmful outcomes of this threat (Rogers, 1983). Determination of what kind of coping strategy will be chosen depends on some factors. Unger and his colleagues (1998) showed that the choice of coping strategies was dependent on levels of stress and social resources. Respondents with high levels stress were likely to use emotion-focused coping strategies, that is a maladaptive coping, and respondents with high levels of social resources were likely to use problem-focused coping strategies, that is an adaptive coping. Therefore, to motivate individuals to perform an adaptive coping, like preparing for earthquakes, perception of the level of threat and resources should be relative. The significant relationship between both self-efficacy and outcome efficacy with the level of earthquake preparedness level is also a good evidence to this statement.

The results of regression analysis revealed that there is a significant negative relationship between avoidance symptoms with the level of earthquake preparedness behavior.

Instead of real images, media reflects a tragic view of earthquakes and distort the reality by selecting totally destroyed house pictures from the earthquake areas and reporting dramatic anecdotes (Cowan, Mc Clure & Wilson, 2002). This way of media in reflecting earthquake might cause that people perceived the event as unpreventable. Because, these tragic views and anecdotes may lead to fatalistic thinking and fatalistic thinking may lead to denial of the risk and the denial of the risk reduces earthquake preparedness behavior. In order to decrease the denial of the event, media often reminds the possible future earthquake as a natural event, damages of which can be prevented.

The results of the current study revealed that severity of exposure of past earthquake experience predicted earthquake preparedness significantly. Weinstein (1989) and Rogers (1975) reported that past experience and its severity increase awareness about natural hazards. The relationship between past earthquake experience and earthquake preparedness behavior was reasoned by four possible causes.

1) Past earthquake experience may influence people to gather more information about earthquakes, thus leading individuals with past experience to adopt earthquake preparedness behavior.
2) The general message given to a community after an earthquake is to report that people were injured, economically impact and psychologically distressed. Therefore, individuals of this community are directed to prepare for the next earthquake.

3) Past earthquake experience may increase the likelihood that people would believe their own possibility are greater than average to experience another earthquake. In other words, past experience would alert people about the probability of occurrence of similar events in the future and thus might affect their judgments about preparedness.
4) Awareness is an important condition for earthquake preparedness and past earthquake experience might increase earthquake related awareness and so earthquake preparedness behavior.

The results of this study provided limited evidence to support past research as to what socio-demographic factors predicted earthquake preparedness behavior. Although, in regression analysis, step 1, consisting of socio-demographic variables, is significant, age is the only socio-demographic variable that was a significant predictor of the earthquake preparedness behavior. In terms of age, older individuals were significantly better prepared than younger ones.

Considering five subcategories of preparedness, the most widely conduct preparedness category was utilities and the least widely conduct preparedness category was supply (see Appendix 2). High scores on utilities items may not be an indicative of a behavior only for preparing for a potential future earthquake. Because knowing how to operate utilities may be indicative of another purpose. Utilities scores were also significantly higher than all other subcategories with respect to perceived effectiveness of being

prepared and significantly lower than others with respect to perceived difficulty of being prepared.

With respect to supply subcategory, the most widely obtained preparedness item was an operating flashlight and emergency telephone number list and the least widely obtained supply item was an operating fire extinguisher.

Stabilization subcategory is perceived as the most difficult subcategory to obtain. Preparedness items in this subcategory need slight ability, knowledge and some devices. The item of the control of house resistance by experts is perceived as the most difficult item to make. This control is very expensive and the price of it may cause of low level of taking this precaution.

Considering effectiveness, knowing the location of gas shut and knowing the location of medical emergency center in your neighborhood items were perceived as the most effective preparedness items. Therefore, earthquake preparedness training should contain this kind of information to satisfy participants.

4.2. Reasons for Non-Preparedness

Only 19.3% of the respondents answered “yes” to the question of “according to you, have you made adequate preparations for an earthquake” and 80.7% of respondents answered “no” to the same question. The results of the current study showed that,

consistent with the study of Kasapoğlu and Ecevit (2003), participants who did not prepare for a possible future earthquake provided the reasons of lack of economic power (25.7%), lack of knowledge (13.8%) and fatalistic thinking (11.5%) in the given order. In the current study, in addition to the list of Kasapoğlu and Ecevit, neglectfulness (45.4%), trust in their building (29.8%), being at rent (19.7%), lack of time (16.5%) and don't think to stay at this house for a long time (14.7%) were other reasons for non-preparedness.

According to the findings of current study, neglectfulness was the most important factor for non-preparedness. In order to prevent neglectfulness, officials and media often reminds that there are several preparedness ways for reducing the earthquake damages.

4.3. Coping Strategies and Preparedness Behavior

In the current study, the factor analysis to the Ways of Coping Questionnaire showed that coping strategies can be grouped into four categories. These categories were called as problem solving/optimistic approach, helplessness/self-blaming approach, fatalistic approach and seeking social support. Previous studies performed to reveal the factor structure of WCI have showed different results. The factor structure of WCI obtained from the present study was consistent with the studies of Bouchard and his colleagues (1997), Karancı et al., (1999) and Güneş (2001). On the other hand, the factor structure of WCI was different from the studies of Folkman and Lazarus (1985), Siva (1988) and Şahin and Durak (1995). The WCI has been used with different samples and different

subscales for this instrument have been proposed. Therefore, the researchers should perform factor analysis on the WCI for their samples, because the structure of coping seem to change from one sample to another.

According to pearson product-moment correlation coefficients, significant intercorrelations were found between subscales. Problem solving/optimistic approach was negatively correlated with helplessness/self-blaming approach and fatalistic approach. Fatalistic approach was positively correlated with helplessness/self-blaming approach.

Apart from seeking social support, all subscales of WCI had significant intercorrelations with preparedness behavior.

Problem solving/optimistic coping was significantly and positively, on the other hand, fatalistic and helplessness/self-blaming coping were significantly and negatively correlated with preparedness behavior. These findings seem as consistent with related literature. Problem-focused coping is usually seen as more effective than emotion-focused coping, because it focuses on thougths and actions for generating solutions to the causes of distress (Folkman & Moskowitz, 2000). People who do not explain the natural disasters with fatalism are found to have made much more preparation for an earthquake than the ones who lend the responsibility to others and who explain natural disasters with fatalism (McClure, Walkey and Allen, 1999).

Scores on problem solving/optimistic approach were higher than seeking social support, fatalistic approaches and helplessness/self-blaming. It can be concluded that the most frequently used coping style for the sample of the current study was problem solving/optimistic style. Problem solving/optimistic style was followed by seeking social support, fatalistic and helplessness/self-blaming styles, respectively. Therefore, it seems that, for the present sample a favorable situation for engaging in preparedness behaviors exists.

4.4. Impact of Event and Preparedness Behavior

The responses to the 15 items of Impact of Event Scale were subjected to factor analysis. With the use of scree plot and further analysis, with restrictions on the number of factors, a two-factors solution explaining 46% of the total variance produced the clearest result. Factors were labeled as "intrusion" and "avoidance". Cronbach's alpha reliability coefficient for internal consistency of the intrusion subscale and avoidance subscale was satisfactory. In disaster literature, the IES has been used to assess avoidance and intrusion in a variety of trauma exposed populations including earthquake survivors (Carr et al., 1997a; Carr et al., 1997b; Manuel & Anderson, 1993, Güneş, 2001).

Güneş used Impact of Event Scale to measure subjective distress of the survivors of 1999 Marmara Earthquake after 6 months from the earthquake. ın the current study, Impact of Event Scale was used after 5 years from this earthquake. As an interesting finding, when the mean score of avoidance subscales are the same, intrusion mean scores of the current study are higher than the mean scores of the study of Gunes. High distress

level in the current study seems related to possible future earthquake instead of past earthquake experience.

According to pearson product-moment correlation coefficients, following intercorrelations were found among avoidance, intrusion and preparedness behavior. There were no significant intercorrelations between IES factors and preparedness behavior. The correlations between the subscales were found to be significantly positive.

Scores on intrusion subscale (M=2.38) were higher than avoidance subscale (M=2.12). Therefore it may be concluded that, possibility of a severe earthquake causes to intrusion more than avoidance.

4.5. Importance of the Study

This study has been devoted to the problem of persuading individuals to adopt behaviors for preparing to reduce the risk of possible future earthquakes. For this reason, in this study, factors related to earthquake preparedness were examined. Understanding the social and psychological factors is very important to reduce the negative effects of disasters and foster preparedness behaviors. As a result, in a country like Turkey which is on the active seismic zone and which has already experienced great earthquakes and also having a serious risk of experiencing one again, to be prepared for a possible earthquake would reduce the number of life and property loss and with decreasing the psychological distress caused by the expectations of future earthquake it will have a

protective effect on the mental health of people. In Turkey, earthquake preparedness is insufficient that is why in an earthquake with the same strength there is more loss of property and lives than in the countries having precautions.

Findings of the present study will provide information to officials, who work to motivate people to prepare for earthquakes. Knowing the factors predicting preparedness for reducing the earthquake damages will allow officials to focus on the effective variables. The role of earthquake preparedness studies has also very important implications for disaster education programs, related programs on media and government coverage in this respect.

Literature assumes that under proper conditions, warnings can be taken seriously and the current study supported that age, self-efficacy, outcome efficacy, trait anxiety, the severity of the exposure to past earthquake experience and avoidance symptom levels of impact of event scale are significant in predicting earthquake preparedness behavior. These findings should be used in projects for facilitating the efficacy of protective behaviors and one's capability to prepare.

Knowing the variables related to earthquake preparedness has three important consequences;

- Preparedness for earthquakes reduces the physical hazards of the event.

- Preparedness for earthquakes reduces psychological distress related to the probability to occurence of these disasters. Because protective actions and providing knowledge about disasters should be considered as an effective strategy to cope with disaster related stress. To test this notion the following item was analyzed that "if you take precautions, did taking precautions effects psychological distress related to a possible earthquake". Findings showed that, while 61.5% of participants answered as it reduced, 4.8% of participants answered as it increased the distress.
- Preparedness for earthquakes may be thought as a protective factor from PTSD. Because, if a person prepares for a possible future disaster he aware of the consequences of the disaster.

4.6. Limitations of the Study

In the present study, it is questionable that the participants represent a random sample of the whole population of Istanbul. For example, Socio-economic-status of the present sample was high and the data was obtained from the family of the students of two university and two colleges. In this respect, most of the households had a child in the university. Therefore, the findings can be generalized only to the samples which have similar characteristics and needs to be replicated with larger represantative samples.

Due to the period of time that elapsed since the 1999 Marmara Earthquake, at the time of the study it was not so clear that sources of distress related to earthquake resulted from past earthquake experience or the possibility of a future earthquake.

In the present study the Revised and Translated Mulilis- Lippa Earthquake Preparedness Scale was conducted as first time in Turkey. The scale is a behavioral scale, assessing individual behavioral involvement in earthquake preparedness. The 27 items represent all standard suggestions appearing in earthquake preparedness brochures and books that are specifically and clearly related to earthquake preparedness. In the current study, the scale was used to assess the degree of preparedness and to obtain the ratings of the perceived difficulty and perceived effectiveness of obtaining or performing each item in the scale. Although it was strongly emphasized that "the items for earthquake", whether each item in the scale is an indicative of a behavior only for preparing for a possible future earthquake is an important question. For example, the items of "having 4 days supply of dehydrated or canned food" may be an indicative of the participants' shopping habits instead of earthquake preparedness behavior. As another example, "knowing how to operate the water shut-off valve" may be an indicative of another necessity instead of earthquake preparedness. Similarly, an individual can have an operating transistor radio for listening music.

4.7. Directions for Future Research

Further effective research on earthquake preparedness behavior requires larger and representative samples. In order to understand earthquake preparedness behavior better, longitudinal studies, where the preparedness level are assessed at different times before and after the earthquake, can be conducted. For future studies, both increasing self-efficacy and outcome efficacy and decreasing avoidance symptoms on earthquake preparedness behavior should be examined. The complex interaction among past earthquake experience, anxiety and earthquake preparedness behavior should be considered in longitudinal studies.

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APPENDICES

APPENDIX 1

Revised and Translated Mulilis-Lippa Earthquake Preparedness Scale (MLEPS)

1. Depremden hemen sonra kullanmak üzere, aşağıdakilerden hangilerini evinizde kolayca ulaşabileceğiniz bir yere koydunuz, bu hazırlığı yapmak sizce ne kadar zor ve bu hazırlık deprem sonrası için sizce ne kadar yararlı?

Maddeler	Hazırladınız mı?	Ne kadar zor (1-3)	Ne kadar yararlı (1-3)
a. Çalışır durumda bir fener	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok
b. Fener için yedek piller	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok
c. Çalışır durumda pilli bir radyo	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok
d. Radyo için yedek piller	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok
e. İlkyardım seti	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok
f. Plastik kapta en az 10 litre su	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok
g. En az 4 gün için yeterli olacak konserve veya kuru gıda	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok
h. Dolu ve çalışır durumda bir yangın söndürme cihazı	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok
i. Acil durum telefon numaraları listesi	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok

2. Aşağıdaki kapatma vanası ve şalterlerin yerlerini biliyor musunuz, bunu öğrenmek sizce ne kadar zor ve bu bilgi deprem sonrası için sizce ne kadar yararlı

Maddeler	Biliyor musunuz?	Ne kadar zor (1-3)	Ne kadar yararlı (1-3)
a. Su vanası	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok
b. Gaz vanası	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok
c. Elektrik sigortaları	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok

3. Aşağıdaki vana ve şalterlerin nasıl kapatıldığını biliyor musunuz, bunu öğrenmek sizce ne kadar zor ve bu bilgi deprem sonrası için sizce ne kadar yararlı

Maddeler	Biliyor musunuz?	Ne kadar zor (1-3)	Ne kadar yararlı (1-3)
a. Su vanası	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok
b. Gaz vanası	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok
c. Elektrik sigortaları	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok

4. Evinizde bulunan aşağıdaki büyük eşyaları depremde devrilmeyecek şekilde duvara sabitlediniz mi, bu hazırlığı yapmak sizce ne kadar zor ve deprem anı için ne kadar yararlı?

Maddeler	Sabitlediniz mi?	Ne kadar zor (1-3)	Ne kadar yararlı (1-3)
a. Şofben	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok
b. Dolaplar	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok
c. Yüksek mobilyalar	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok
d. Duvara asılı büyük objeler (ayna, resim)	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok

5. Ailece deprem anı ve sonrası acil durum planı yaptınız mı, bunu yapmak sizce ne kadar zor ve ne kadar yararlı?

Maddeler	Yaptınız mı?	Ne kadar zor (1-3)	Ne kadar yararlı (1-3)
a. Deprem sonrası buluşma yeri belirlediniz mi?	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok
b. Evde deprem sırasında sığınabileceğiniz güvenli bir yer belirlediniz mi (çelik kapı eşiği ya da demir masa altı gibi)	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok

6. Deprem hazırlığı amacıyla aşağıda belirtilen önlemlerden hangilerini aldığınızı, her bir madde için bu önlemi almanın sizce ne kadar zo r olduğunu ve bu önlemi almanın sizce ne kadar faydalı olduğunu belirtiniz.

	Maddeler		**Ne kadar zor (1-3)**	**Ne kadar yararlı (1-3)**
a.	Oturduğunuz yere en yakın sağlık merkezinin yerini biliyor musunuz?	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok
b.	"Depremlere hazırlıklı olmak" konusundaki yazıları (broşür, kitapçık, gazete vb.) okur musunuz?	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok
c.	Deprem hazırlığıyla ilgili televizyon ve radyo haberlerini dikkatle dinler ve izler misiniz?	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok
d.	Deprem hazırlığı ile ilgili kurs veya seminerlere katılır mısınız?	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok
e.	İlk yardım eğitimi aldınız mı?	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok
f.	Zorunlu deprem sigortası (DASK) yaptırdınız mı?	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok
g.	Evinizin dayanıklılık kontrolünü yetkililere yaptırdınız mı?	Evet( ) Hayır( ) Emin Değilim( )	Hiç Biraz Çok	Hiç Biraz Çok

APPENDIX 2

PERCENTAGES OF PREPAREDNESS ITEMS

Supply Items	Preparedness %
a) An operating flashlight	59.2
b) Extra batteries for the flashlight	25.7
c) An operating transistor radio	29.8
d) Extra batteries for the transistor radio	18.3
e) A complete first-aid kit	33
f) At least 4 gallons of water in plastic containers	30.3
g) At least 4 days supply of dehydrated or canned food	19.3
h) An operating fire extinguisher	13.3
i) Do you have emergency telephone number list in a easily reachable place	49.5

Utilities Items	Preparedness %
a) Location of the water shut	94.5
b) Location of the gas shut	78.4
c) Location of the electric power shut	96.8
d) How to operate water shut	91.3
e) How to operate gas shut	78.4
f) How to operate electric power shut	94.5

Stabilization Items	Preparedness %
a. Water heaters	58.7
b. Cupboards	31.2
c. Tall furniture	21.6
d. Heavy objects placed high on walls	32.6

Planning Items	Preparedness %
a) Does your household have a meeting place to come together after a possible earthquake.	30.7
b) During a possible earthquake, does your household have a plan for a safe place.	53.7

Knowledge Items	Preparedness %
A. Do you know the location of a medical emergency center in your neighborhood	96.3
B. Do you read material on earthquake preparedness	82.1
C. Do you attentively listen to or watch radio or television messages about earthquake preparedness	83
D. Do you attend meetings held by schools or civic organization for the purpose of establishing earthquake preparedness	29.4
E. Does your household have earthquake preparedness insurance	29.4
F. Have you attended a first aid course	54.6
G. Have the officials made the control of resistance of your house	39

APPENDIX 3

Distribution of the Participants to the Districts of İstanbul

District	N	Percentage
Adalar	1	.5
Avcilar	8	3.7
Bagcilar	5	2.3
Bahcelievler	14	6.4
Bakirkoy	17	7.8
Bayrampasa	4	1.8
B.cekmece	1	.5
Besiktas	14	6.4
Beykoz	6	2.8
Beyoglu	9	4.1
Catalca	3	1.4
Eminonu	2	.9
Esenler	3	1.4
Eyup	1	.5
Fatih	9	4.1
Gaziosmanpasa	1	.5
Gungoren	5	2.3
Kadikoy	28	12.8
Kagithane	3	1.4
Kartal	13	6
Kucukcekmece	1	.5
Maltepe	3	1.4
Pendik	4	1.8
Sariyer	15	6.9
Sile	2	.9
Silivri	3	1.4
Sisli	21	9.6
Sultanbeyli	1	.5
Tuzla	2	.9
Umraniye	2	.9
Uskudar	8	3.7
Zeytinburnu	5	2.3
Missing	4	1.8
Toplam	218	100