

# Post-Earthquake Trauma Levels of University Students Evaluation: Example of 6 February Kahramanmaraş Earthquake

Erol Koçoğlu<sup>1</sup>, Fatıma Betül Demir<sup>2</sup>, Ülkü Ulukaya Öteleş<sup>3</sup> & Ender Özeren<sup>4</sup>

<sup>1</sup> Assoc. Prof. İnönü University, Malatya, Turkey

<sup>2</sup> Assit.Prof. Bartın University, Bartın, Turkey

<sup>3</sup> Assit.Prof. Muş Alparslan University, Muş, Turkey

<sup>4</sup> Dr. Dicle University, Diyarbakır, Turkey

Correspondence: Erol Koçoğlu, Assoc. Prof. Malatya University, Malatya, Turkey. Tel: 90-507-697-2391.  
E-mail: erol.kocoglu@inonu.edu.tr

Received: March 17, 2023

Accepted: April 25, 2023

Online Published: May 5, 2023

doi:10.5539/hes.v13n2p121

URL: <https://doi.org/10.5539/hes.v13n2p121>

## Abstract

The earthquake, which affected the south and southeast of Turkey (approximately 10 provinces) on February 6, 2023, brought many devastating consequences. Earthquakes, which occur in all geographies of the world in variable time periods depending on the characteristics of the geological structure, cause many extraordinary situations and consequences for humanity. This situation and results require people defined as disaster victims to struggle with psychological problems arising from the effects of the event. Based on this, this study aims to determine the post-earthquake trauma levels of university students who experienced and were affected by two earthquakes that took place nine hours apart on February 6, 2023, where the districts of Pazarcık (Earthquake intensity 7.7) and Elbistan (Earthquake intensity 7.6) in Kahramanmaraş province of Turkey were the epicenters. intended to be evaluated. In the study, which was carried out with the quantitative research method and the survey model, criterion sampling, one of the purposive sampling methods, was used to determine the research group. Data were collected with the "personal information form" created by the researchers and the "post-earthquake trauma level determination scale" developed by Tanhan & Kayri (2013). Unlike many studies on the extent of the earthquake that took place, it can be said that as a result of this study, which aims to examine the psychological and mental state of earthquake victims, many remarkable results such as the fact that the trauma levels of female earthquake victims are higher than that of men.

**Keywords:** earthquake, trauma, evaluation, Turkey, Kahramanmaraş

## 1. Introduction

Natural disasters in the world have many devastating effects. Depending on the type of disaster and the nature of the geography in which it occurs, the extent of these effects differs. Earthquake is one of the natural disasters that cause these effects. Earthquake, which differs according to the causes of its formation, can be defined as the reflection of the energy released on the earth by the vibration, oscillation and fracture occurring at any point of the earth's crust. It can be said that the reflections of the earthquake energy are generally negative because the structures in the geography are not built according to the geological characteristics of the geography. Earthquake, which is called seismic hazards and whose negative results such as vibration, surface fractures, landslides, liquefaction and tsunami are frequently encountered in nature, have many negative effects on human life, both materially and spiritually. The concept of earthquake victims, formed by people who have experienced the earthquake, consists of people who have many of these negative effects. At the forefront of these effects are the physical and mental problems that occur in the earthquake victims as a result of the earthquakes. Regarding the solution of the problems experienced, the experts in the relevant institutions and organizations can take the relevant measures in the earthquake areas, and the problem can be overcome in a short time.

### 1.1 Literature Review

The housing construction (building, house, workplace, etc.), which is a product of the socialization process and constitutes the formal process of creating the culture of living together, causes great damage as a result of some natural disasters. Earthquakes are at the forefront of the disasters that cause these damages. The process of

repairing these damages on buildings and people takes a long time. The loss of life and property caused by the earthquake in the region, and the negative experiences after the earthquake can be shown as evidence of the length of time the effects of this natural disaster lasted. The resulting physical and psychological destruction is considered as an important traumatic event, especially in people who experienced an earthquake and were described as earthquake victims (Kurt & Gülbahçe, 2019; Mendoza, Poblete & Valderrama, 2019). Although the psychological problems caused by the earthquake experienced rarely show themselves instantaneously in earthquake victims, they may manifest themselves more frequently and repetitively in the later periods of their lives (Kardaş, 2013). These problems can be observed in earthquake survivors in the form of actions such as anxiety disorder, extreme stress, hopelessness, fear, and unhappiness. Necessary measures should be taken by psycho-social support staff in order to deal with and eliminate these observed problems within the concept of trauma.

### *1.2 Earthquake and Trauma*

The earthquake, which is defined as the event of shaking the environments and the ground surface, where the vibrations that occur suddenly due to the fractures in the earth's crust spread as waves, is a sign that shows that the soil, which people accept as immobile and on which they step safely, will also move and that all structures on it can be damaged and collapse with loss of life. It is a natural phenomenon. However, the phenomenon of shaking the earth by the spreading of the vibrations, which occur with the sudden discharge of the energy accumulated on the fault planes in the earth, is called an earthquake. Earthquakes are natural phenomena. It is not a disaster by itself (Kutlu Ünal, 2019). Earthquake is one of the most important natural events affecting human beings since the existence of the world and humanity. Due to population growth and structuring, it has started to gain importance as the earthquake has an impact on assets in addition to its impact on people. At first, people saw earthquakes as the effects of supernatural powers or as God's means of testing and punishing people. With the increase in scientific studies after the 18th century, scientific studies on earthquakes emerged (Kutlu Ünal, 2019). People who are exposed to this nature mockery are called earthquake victims. It can be said that as a result of the disaster experienced by earthquake survivors, they faced some psychological problems. These problems, called traumatic events, require the interaction of earthquake victims with post-earthquake prolongation.

Traumatic event that causes significant changes in the lives of people who have experienced the disaster and harms their vital integrity, a real death, death threat, serious injury, experiencing, witnessing or learning an event that threatens the physical integrity of oneself or others, and fear, horror, It is defined as showing reactions such as helplessness (DSM-IV, 1995; Tanhan & Kayri, 2013). Based on this definition, the level of impact of traumatic events varies from person to person. As a result of the earthquake, which is the subject of the research, not every traumatic event that occurs in earthquake survivors causes similar reactions in the individual, and those who experience the same traumatic event may give different reactions (Özçetin, Maraş, Ataoğlu & İçmeli, 2008; Tanhan & Kayri). The effects of traumatic events as a result of a natural disaster (earthquake) on earthquake victims are evaluated in two ways. In these stages, which are called acute and post-traumatic periods, the course of traumatic events differs. It can be said that post-traumatic stress disorder, which occurs as a result of the traumatic event, is one of the most common problems after the earthquake in both periods. In order to eliminate the duration and rate of impact of these problems, experts working in the relevant institutions and organizations in the country and region where the earthquake occurred should be actively involved in the post-earthquake period.

In particular, examining the trauma levels of people who experienced the earthquake will help to take necessary precautions and to intervene in similar situations that may be experienced. In this study, which was prepared in this direction, it was aimed to evaluate the trauma levels of the university students who experienced the earthquakes centered in Pazarcık and Elbistan in Kahramanmaraş city center of Turkey on February 6, 2023. It was investigated whether there was a difference in the post-earthquake trauma levels of university students according to gender, class level, and educational status of disaster management.

## **2. Research Design**

This study, which aims to determine the trauma levels of students after the earthquake, was designed with a quantitative method. The quantitative method is the study of the social world of researchers within the framework of certain variables and the relationship between these variables or the effect of an intervention (Merkan, 2015). The screening (survey) pattern, which is widely used among quantitative research methods, is the characteristics of the large masses associated with the research (age, gender, etc.) are descriptive studies conducted for the purpose of determining (Can, 2014). The current research has been designed with a survey model to describe the level of trauma of students after an earthquake and to determine in which direction the

variables that are thought to be effective in these trauma levels differ from the trauma of students.

### *2.1 The Working Group of the Research*

Undergraduate students constitute the universe of the research. Criterion sampling, one of the purposeful sampling methods, was used to determine the sample of the research. Criterion sampling is the selection of situations containing rich information, the questions related to the main purpose of the research that can be analyzed in depth (Patton, 2014). In this direction, the criterion for determining the study group of the study is that the participants are undergraduate students who experienced the February 6, 2023 earthquake. Students who experienced the earthquake in a total of 10 provinces, including Kahramanmaraş, Gaziantep, Hatay, Osmaniye, Kilis, Adıyaman, Şanlıurfa, Diyarbakır, Malatya and Adana, where the earthquake occurred and was declared a disaster zone, participated in the research. A total of 264 students participated in the research in accordance with the determined criteria.

Of the students participating in the study, 141 (53.4%) were female and 123 (46.6%) were male. 60 (22.7%) of the students are in the 1st grade; 64 (24.2%) were in the 2nd year; 74 (28%) of them are studying in the 3rd grade and 66 (25%) are in the 4th grade. 170 (64.4%) of the students' departments were social sciences (social studies teaching, sociology, law, etc.) and 94% (35.6%) mathematics and science (science teaching, mathematics, engineering, etc.) 71 (26.9%) of the students have taken a training or course related to disaster management/education, and 193 (73.1%) of them have not taken any training or course related to disaster management/education.

### *2.2 Data Collection Tool*

In the study, the "Post-earthquake Trauma Level Determination Scale" developed by Tanhan and Kayri (2013) in the dimensions of "Behavioral Problems", "Excitement Limitation", "Affective", "Cognitive Structuring" and "Sleep Problems" was used. The scale, which consists of 20 items and a five-point Likert structure, is in the form of "strongly disagree", "little agree", "moderately agree", "strongly agree" and "strongly agree". Eighteen of the scale items have positive expressions and 2 (items 11 and 12) have negative expressions. The total Cronbach alpha reliability coefficient of the scale is 0.87. The lowest score that can be obtained from the scale is 20 and the highest score is 100. The increase in the scores obtained from the scale indicates that the individuals' level of being affected by the earthquake increases. The Cronbach alpha reliability coefficient calculated for this study is .90.

In order to determine the demographic information of the participants and to determine the variables, a "Personal Information Form" was added by the researchers before the scale items. In this form, various questions asked to the participants (gender, department of education, educational status, training or taking a course related to disaster management/education) were included.

### *2.3 Data Collection and Analysis*

As a result of the natural disaster experienced in Turkey on February 6, 2023, the data were obtained online, taking into account the opportunities and conditions required by higher education institutions to carry out the spring semester of the 2022-2023 academic year with distance education. The questionnaire form was delivered online by the lecturers of the university students. The data were collected in March 2023, on a voluntary basis and after obtaining the consent of the participants to participate in the research.

SPSS 23.00 program was used in the analysis of the obtained data. The data obtained in the first stage were transferred to digital media. Negative items (11th and 12th items) were reverse coded and the scores obtained from the items were calculated and analyzed over the total scores. Then, normality analyzes of the data (Kolmogorov-Smirnov test, skewness and kurtosis values) were performed and it was determined that normality was achieved. It was determined that the Kolmogorov-Smirnov test result should be .32, and its normality was ensured. In addition, it was observed that the data had skewness (-.20) and kurtosis (-.26) values. Independent Sample t-Test (gender and disaster management/training related education or course) based on total scores; ANOVA (educated department, educational status) analyzes were made.

## **3. Findings and Interpretation**

Findings related to the level of post-earthquake trauma of the students and the variables that are thought to be effective in these trauma levels are given in the relevant tables, respectively.

Table 1. Post-earthquake trauma levels of university students

Trauma level after earthquake	N	$\bar{X}$	Sd
Behavior Problems	264	2.43	3.53
Excitement Limitation	264	3.28	5.34
Affective	264	2.75	3.31
Cognitive Configuration	264	3.21	3.71
Sleep Problems	264	2.99	3.90
<b>Total</b>	264	3.73	16.45

The post-earthquake trauma levels of university students are presented in Table 1. When the findings are examined, the average score of the post-earthquake trauma levels of the students is  $\bar{X} = 3.73$ . "Behavioral Problems" dimension mean score is low with  $\bar{X} = 2.43$ ; the mean score of the "Excitable Limitation" dimension was moderate with  $\bar{X} = 3.28$ ; the mean score of the "Affective" dimension was moderate with  $\bar{X} = 2.75$ ; the mean score of the "Cognitive Configuration" dimension was high with  $\bar{X} = 3.21$ ; the mean score for the "Sleep Problems" dimension is moderate with  $\bar{X} = 2.99$ . As a result, it is seen that the post-earthquake trauma levels of the students are high. When the dimensions of post-earthquake trauma levels are examined, it is seen that the "Cognitive Structuring" dimension is at a high level and the other dimensions are at a medium level. In this context, it can be said that the students are worried about the people around them, they feel uneasy all the time, they constantly remember the earthquake, and their anxiety about their own future is high.

Table 2. The results of t-test analysis of post-earthquake trauma levels of university students by gender

Trauma level after earthquake	Variables	N	X	S	sd	T	p
	Famale	141	72,11	15,16	262	4,02	,00
	Male	123	64,16	16,91			

The results of the gender analysis of the post-earthquake trauma levels of university students are presented in Table 2. When the findings are examined, it is seen that the trauma levels after the earthquake show a significant difference according to the gender of the students [ $t_{(262)} = 4.02$ ;  $p < 0.05$ ]. This difference is in favor of female participants. As a result, it can be said that the post-earthquake trauma levels of female students are higher than male students.

Table 3. The results of the t-test analysis according to the post-earthquake trauma levels of the university students according to their education/course taking on disaster management/education

Trauma level after earthquake	Variables	N	X	S	sd	T	p
	Took a training/course on disaster management/education	71	67.63	18.72	262	-46	.64
	Did not take any training/course on disaster management/training	193	68.69	15.58			

The results of the analysis of the post-earthquake trauma levels of university students regarding the status of taking an education/course on disaster management/education are presented in Table 3. When the findings are examined, it is seen that the post-earthquake trauma levels do not show a significant difference according to the status of the students taking an education/course on disaster management/education [ $t_{(262)} = -46$ ;  $p > 0.05$ ].

Table 4. Anova results of post-earthquake trauma levels of university students according to grade level

Source of Variance	Sum of Squares	Sd	Mean Square	F	P
Between groups	1175.321	3	391.774	1.454	.22
Within groups	70064.497	260	269.479		
Total	71239.818	263			

The results of the analysis regarding the post-earthquake trauma levels of university students and their grade levels are presented in Table 4. When the findings are examined, there is no significant difference between the post-earthquake trauma levels according to the grade level of the students [ $F_{(3-260)} = 1.454$ ;  $p > 0.05$ ]. As a result, it can be said that all students have high post-earthquake trauma levels, regardless of grade level.

#### 4. Conclusion

Natural and human-caused disasters have been experienced in different countries of the world in the last fifty years. These disasters have caused a large number of people to lose their lives and the survivors to experience physiological and psychological problems. As a result of the disasters experienced by humans, two important inferences have been reached. These inferences are that disasters are completely unpredictable and difficult to manage. Earthquakes are one of the disasters that cannot be predicted in advance and are difficult to manage. This disaster occurs especially in places where fault lines are located and are called the earthquake belt. Thousands of earthquakes with different numbers and severity come to the challenge every year in the regions called earthquake belt. Turkey is located in the Alpine-Himalayan belt, which is among the most important earthquake belts of the world. In this context, there have been many earthquakes in Turkey that have caused damage and loss of life. On February 6, 2023, earthquakes of 7.7 Mw and 7.6 Mw, the epicenter of which were in Pazarcık and Elbistan districts of Kahramanmaraş, respectively, are among these. As a result of the earthquakes, nearly fifty thousand people lost their lives and more than one hundred thousand people were injured. In the related study, post-earthquake trauma levels of undergraduate students who experienced the 6 February 2023 earthquake were examined in the context of various variables.

As a result of the research, it has been found that the trauma levels of undergraduate students are high. At the same time, it was found that the trauma levels of the students differed in the context of the gender variable. According to this, it has been found that the trauma level of women after a disaster is higher than that of men. However, it was found that the trauma level of undergraduate students did not differ according to the variable of taking a course on disaster management and the grade level.

#### 5. Discussion

The findings obtained from the research are that the trauma levels of the students after the earthquake are high. When the dimensions of trauma levels after the earthquake are examined, it is seen that the "Cognitive Configuration" dimension is at a high level and the other dimensions are at a medium level. When the content of the cognitive configuration dimension is examined, it is seen that the individual's anxiety towards the earthquake is related to feelings of anxiety and fear of losing family members. Studies conducted with people affected by disasters, especially earthquakes, show that the mental health and trauma levels of disaster victims are high. At the same time, post-traumatic stress disorder, acute stress disorder and anxiety disorder are observed as a result of natural disasters (Lee & Lee, 2019). As a matter of fact, studies conducted by Neria & Sullivan (2011), Silver et al. (2013) and Varol & Gültekin (2016) also found that people have high levels of trauma after disasters and face various psychological problems. This result can be evaluated in the context of the devastating effects of disasters on the individual and society.

Another finding obtained from the research is that the trauma levels of undergraduate students do not differ according to the variable of taking a course or training for disaster management. The relevant finding of the research can be interpreted as that disaster management courses and disaster education focus on the behaviors that individuals should do before, during and after a disaster and are not directly effective in preventing the trauma that an individual experiences after a disaster. At the same time, the extent and severity of the trauma experienced by individuals after a disaster may not be completely predictable and may not be at the same level in every individual. Research conducted on this situation shows that many factors such as the magnitude of the destruction caused by a disaster, the events encountered by an individual during a disaster, and the width of the disaster area can have an impact on the level of trauma and stress experienced by individuals (Nort, 2001; Tanrıdağlı et al., 2005). In this context, through disaster education, the desired success may not be achieved from the training given to individuals on how to cope with the trauma they experience in a disaster situation.

In the research, it was also examined whether there is difference between the trauma levels of male and female students. The obtained finding shows that women have higher levels of trauma after earthquakes compared to men. In traditional family structures, it is accepted that women have a role for the care and protection of the family. A woman is raised with this understanding from the first years of her life. Therefore, even in a disaster such as an earthquake, a woman may feel anxiety and anxiety towards her husband, child, brother and elderly family members before herself. It is also known that women are more emotional than men. When these situations are taken into consideration, it may be normal for women's stress and trauma to be higher than men's. The relevant finding of the research is Kuo et al. it is also in parallel with the findings of the (2003) studies. Kuo et al. (2003) in their study, they interviewed men and women who lost their relatives after the 1999 Taiwan earthquake. As a result of the interview, it was found that women are more likely to be depressed after an earthquake than men.

The final finding obtained from the research is that the trauma levels of the students after the earthquake do not differ according to the grade level variable. This situation can be interpreted as the time spent by individuals at the university and the courses they take are not effective in reducing trauma levels after an earthquake. However, compared to the first stage of undergraduate education, the number of vocational and field courses taken by students in other stages is increasing. At the same time, it is expected that their participation in disaster-related seminars and various information meetings will increase. Therefore, the relevant finding of the research can be interpreted as unexpected. As a matter of fact, experts are of the opinion that the level of trauma decreases as the education level and age range increase (Hensley & Varela 2008; Maclean vd. 2016))

## 6. Suggestions

Based on the results obtained from the research, undergraduate students can be made operational in universities' disaster preparedness programs in order to be psychologically and physiologically stronger in the face of various disasters, especially earthquakes. In order to prevent the trauma levels of individuals after a disaster, the content and images on social media and the Internet can be selected more carefully. At the same time, the cultural, psychological and sociological reasons for women's high levels of trauma after an earthquake compared to men must be detected and psychological support can be provided to women along the lines of these reasons.

## References

- Can, A. (2014). *Quantitative data analysis in the scientific research process with SPSS* (4. ed). Ankara: Pegem Academy.
- DSM-IV. (1995). *American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders* (Trans. E. Köroğlu, 4. ed.). Ankara: Physicians Publication Association.
- Hensley, L., & Varela, R. E. (2008). PTSD symptoms and somatic complaints following hurricane katrina: the roles of trait anxiety and anxiety sensitivity. *Journal of Clinical Child and Adolescent Psychology*, 37(3), 542-552. <https://doi.org/10.1080/15374410802148186>
- Kardaş, F. (2013). *Investigation of post-traumatic stress, post-traumatic growth and hopelessness levels of university students who experienced the Van earthquake in terms of various variables (Unpublished Master's Thesis)*. Yüzüncü Yıl University, Institute of Educational Sciences, Van.
- Kuo, C. J., Tang, H. S., Tsay, C. J., Lin, S. K., Hu, W. H. & Chen, C. C. (2003). Prevalence of psychiatric disorders among bereaved survivors of a disastrous earthquake in Taiwan. *Psychiatric Services*, 54(2), 249-251. <https://doi.org/10.1176/appi.ps.54.2.249>
- Kurt, E., & Gülbahçe, A. (2019). Investigation of post-traumatic stress disorder levels of students who experienced the Van earthquake. *Journal of Atatürk University Institute of Social Sciences*, 23(3), 957-972.
- Kutlu Ünal, S. (2019). *Earthquake concept perception and earthquake-related evaluations: Example of the 8 March 2010 Okçular-Kovancılar earthquake (Unpublished Master's Thesis)*. Çanakkale 18 Mart University, Institute of Science and Technology, Department of Risk Management of Natural Disasters, Çanakkale.
- Lee, E., & Lee, H. (2019). Disaster awareness and coping: Impact on stress, anxiety, and depression. *Perspectives in Psychiatric Care*, 55(2), 311-318. <https://doi.org/10.1111/ppc.12351>
- Maclean, J. C., Popovici, I., & French, M. T. (2016). Are natural disasters in early childhood associated with mental health and substance use disorders as an adult?. *Social Science & Medicine*, 151, 78-91. <https://doi.org/10.1016/j.socscimed.2016.01.006>.
- Mendoza, M., Poblete, B., & Valderrama, I. (2019). Nowcasting earthquake damages with Twitter. *EPJ Data Science*, 8(1), 1-23. <https://doi.org/10.1140/epjds/s13688-019-0181-0>
- Mertkan, S. (2015). *Mixed research design*. Ankara: Pegem Academy.
- Neria, Y., & Sullivan, G. M. (2011). Understanding the mental health effects of indirect exposure to mass trauma through the media. *JAMA*, 306(12), 1374-1375. <https://doi.org/10.1001/jama.2011.1358>
- North, C. S., Spitznagel, E. L. & Smith, E. M. (2001). A prospective study of coping after exposure to a mass murder episode. *Annals of Clinical Psychiatry*, 13, 81-86. <https://doi.org/10.3109/10401230109148952>
- Özçetin, A., Maraş, A., Ataoğlu, A., & İçmeli, C. (2008). The relationship between post-traumatic stress disorder developed as a result of the earthquake and personality disorders. *Journal of Düzce Faculty of Medicine*, 2, 8-18.
- Patton, M. Q. (2014). *Qualitative research and evaluation methods*. Ankara: Pegem.

- Silver, R. C., Holman, E. A., Andersen, J. P., Poulin, M., McIntosh, D. N., & Gil-Rivas, V. (2013). Mental and physical-health effects of acute exposure to media images of the September 11, 2001, attacks and the Iraq War. *Psychological Science, 24*(9), 1623-1634. <https://doi.org/10.1177/0956797612460406>
- Tanhan, F., & Kayri, M. (2013). The validity and reliability study of the scale for determining the level of trauma after the earthquake. *Journal of Educational Sciences in Theory and Practice, 13*(2), 1013-1025. <https://doi.org/10.1037/t72005-000>
- Tanrıdağlı, C., Karancı, N., & Aker, T. (2004). *The predictors of posttraumatic growth among the survivors of the 1999 Marmara Earthquake, Turkey*. Spiritual Trauma Meetings III; Post-Disaster Mental Health, Prevention, Treatment and Organization Poster Presentation, İstanbul.
- Varol, N., & Gültekin, T. (2016). Disaster anthropology. *Electronic Journal of Social Sciences, 15*(59). <https://doi.org/10.17755/esosder.263244>

### Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/3.0/>).