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RESEARCH ARTICLE

Determination of Post-Earthquake Trauma Levels of University Students

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Abstract
Objective: The aim of this study is to evaluate the post-earthquake trauma levels of young people exposed to earthquake and to examine the effect of recreational sports activities on their social, physical and psychological recovery. **Method:** The study will focus on 10 provinces, Kahramanmaraş, Gaziantep, Hatay, Adıyaman, Adana, Osmaniye, Diyarbakır, Kilis and Şanlıurfa, which were affected by the earthquake disaster centered in Kahramanmaraş. A sample group of 275 people from Artvin Çoruh University will voluntarily participate in this study. Trauma level assessment scale and personal information form will be used to collect data. The research was evaluated at the $p<0.05$ confidence interval. **Result:** The findings of the study show that there is a significant difference between the excitement limitation and affective configuration sub-dimension of the post-earthquake trauma symptoms scale and the gender variable, and that there is a significant difference between the sleep problem dimension and the class variable ($p <0.05$). **Conclusion**: As a result, it is seen that the participants' behavioral problems, emotional limitation, affective structuring and scale total scores are at high levels, while their cognitive structuring and sleep problems are at medium levels.

Keywords
Earthquake, Trauma, Post-Earthquake Trauma Symptoms, University Students

INTRODUCTION

Trauma is a situation that occurs as a result of exposure to an event that threatens or significantly threatens an individual's life and can lead to the development of psychological stress disorder as defined by the American Psychiatric Associationin 2013. Another definition characterizes trauma as anegative impact. Accordingtothe World Health Organizationin 2018, it results from an event that endangers thelives of individuals or others or has the potential to cause serious injury. Trauma is usually the result ofa catastrophic event that can seriously disrupt daily life, such as natural disasters, accidents, attacks orwars. It is psychological trauma that particularly affects the mental health of the individual. This situation has revealed anxiety, which is expressed as the feeling of fear felt by individuals (Güler and Cicioğlu, 2021).

As a result, trauma behaviors can be observed in individuals. As stated in Aykut and Soner-Aykut's (2020) study, the negative effects of trauma can affect the psychological, social, economic and physiological health of the individual. According to the American Psychiatric Association (2013), the National Institute of Mental Health (2021) and the World Health Organization (2018), individuals are prone to experience fear, anxiety, sleep and mood disorders following a traumatic event. Inaddition research has shown that post traumatic stress disorder resulting from

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exposure to trauma has a negative impact on an individual's overall quality of life (Carlssonetal. symptoms such as depression, anxiety and stress, as Sabuncuoğlu et al. (2003) and Uğur et al. (2021). In some cases, posttraumatic stress disorder has been observed (Bedirli, 2014; Hacıoğlu et al.,2002) and a decrease in general well-being has been reported (De & Thamarapani, 2022). Tanhan and Kayri (2013) classified traumatic eventsintwo stages: acute and post traumatic period. The first phase of an individual after experiencing a traumatic event is known as the acute phase, which covers the first thirty days. During this period, clinical symptoms such as dissociation and anxiety arefrequently encountered. In addition to these, the individual may feel helpless, frightened, angry, guilty, extremely restless and may have trouble concentrating. They may try to avoid situations that remind them of the trauma or attempt to escape, and may experience physical discomfort. During this time, it is common for people to constantly replay the traumatic event in their minds. These symptoms are expected to resolve within thirty days. The post-traumatic period lasts for more than a month and is characterized by an exaggerated startle response, constant alertness, sleep disturbances, inability to concentrate and outbursts of anger. Negative thoughts about oneself and others and frequent dreams about the event may also occur during this period (Psychiatry Association, 2013). On February 6, 2023, two earthquakes measuring 7.7 and 7.6 on the Richter scale occurred in Pazarcıkand Elbistan districts of Kahramanmaraş, causing heavy damage in 11 cities in the region. As stated by Maslow (1943) in hihierarchy of needs, thewell-being of individuals is and safety levels after an earthquake. According to published statistics, more than 50,000 people losttheir lives, while 307,000 buildings and 893 separate areas were destroyed, affecting around 14 millionpeople. Following such a devastating disaster, individuals may exhibit post-traumatic symptoms due tothe threat to their basic needs for safety, such as shelter. These symptoms may manifest them selves as cognitive, mood, emotional, behavioral and sleep difficulties (Tanhan & Kayri, 2013). According to Sönmez (2022), depression, anxiety, sleepdisorders, 2006). Psychological research has also revealed that exposure to trauma can cause various physicalsymptoms, dissociation and sexual dysfunctions are potential effects of experiencing an earthquake. The relationship between psychological resilience and posttraumatic stress symptoms was examined by Sakaryaand Güneş (2013) in individuals who experienced the Van earthquake, and post traumatic stress symptoms such as avoid ance, reliving, and dysphoria increased, while resilience decreased. Ayas (2005) also examinedthe psychological symptoms of children living in the earthquake zone 42 months after the Marmara earthquake on August 17, 1999. Significant differences were found between endersinterms of phobic anxiety, eatingand sleep disorders. The2020 Elazığ earth quake was the subject of as tudy by Taşçıand Özsoy (2021) and it was found that in dividuals who directly experienced the earthquake had significantly higher Peritrauma Dissociation Scale and PTSD scores than those without the Checklist. These symptoms may make it difficult forpeople to continue their daily routines and may also negatively affect their capacity to cope with the traumatic experience. Inthis context, the study aimed to answer the following questions:

1. Is there are lationship between the sub-dimensions of post-earthquake trauma levels according tot he gender of the students?
2. Is the rearelationship between the sub-dimensions of post-earthquake trauma levels according to the department of the students?
3. Is the rearelationship between the sub-dimensions of post-earthquake trauma levels according to the class of the students?

MATERIALS AND METHODS

Ethical Permission

Before proceeding with the data collection phase of this study, ethical permission was obtained from Artvin Çoruh University Ethics Committee, dated 03.04.2023 and numbered E-18457941-050.99-87288. Before the study, all individuals were informed about the study and an'Informed Consent Form' was signed. Our study was conducted in accordance with the Principles of the Declaration of Helsinki.

Research Model

According to Karasar (2009), the research was conducted within the scope of the general survey model, which tries to reveal the situations as they are.

Working Group

The study group consisted of 378 students studying at Artvin Çoruh University who were affected by the earthquake in Kahramanmaraş. Convenient sampling method was used when creating the research group. In the selection process of the study group, the density of the student population in various faculties such as Education, Theology, Fine Arts, Engineering, Literature, Medicine, Veterinary Medicine, Economics and Administrative Sciences and Fan faculties were taken into consideration. The study group was selected from students studying at School of Physical Education and Sports, Faculty of Education, Faculty of Health Sciences, Faculty of Arts and Sciences and Faculty of Forestry.

Data Collection Tools

The Post-Earthquake Trauma Level Detection Scale (PTSDI) (Tanhan & Kayri, 2013) and the participant information form prepared by the researchers were used to collect data in the study. The internal consistency coefficient (Cronbach Alpha) of the scale developed by Tanhan and Kayri (2013) to measure the stress levels experienced by individuals after the earthquake was found to be 0.88. These values confirm the reliability of the measurement tool. The scale consists of 20 items and 5 dimensions.

Data Collection Process

For the data collection phase of the study, the questionnaires were handed out, filled in and collected again. In addition, the participants were informed that they would voluntarily participate in the study by explaining the purpose of the study and that the results would not be shared with others.

Data Analysis

The data obtained in the study were analyzed using SPSS 22.0 program. Numbers, percentages, means and standard deviations were used as descriptive statistical methods for data evaluation. In the normal distribution of the data, kurtosis and skewness coefficients were checked and found to be within ±2 values. According to this result, it can be determined that the data fit the normal distribution (George & Mallery, 2003). A t-test was used to compare quantitative continuous data between two independent groups and one- way ANOVA was used to compare quantitative continuous data between more than two independent groups. The Tukey test was used as a complementary post hoc analysis to identify differences after the ANOVA test.

RESULTS

The findings obtained from the statistical analyses conducted within the scope of the study are explained in tables under this heading.

Tables should be numbered and the title of the table should be written in 12 pt. Table title should According to Table 1, the majority of the students participating in the study were female students (53.8%), the highest number of participants in the department variable was School of Physical Education and Sports students (51.3%), and the highest number of participants in the class variable was 3rd grade.

Table 1. Descriptive statistics of the study group

		Frequency	Percent(%)
Gender	Woman	148	53,8
	Male	127	46,2
Section	School of Physical Education and Sports	141	51,3
	Facultyof HealthSciences	103	37,5
	Facultyof Education	22	8,0
	Facultyof Science andLetters	7	2,5
	Facultyof Forestry	2	0,7
Classroom	1st grade	25	9,1
	2nd grade	31	11,3
	3rdgrade	121	44,0
	4thgrade	98	35,6

According to Table 2, it is seen that the participants' behavioral problems, excitability, affective structuring and scale total scores are at high level, while cognitive structuring and sleep problems are at medium level.

Table 2. Descriptive values for the scales

Variables	$\bar{x}$	SD	Kurtosis	Skewness
BehaviorProblems	12,96	2,46	-,456	1,091
ExcitementLimitation	19,54	3,50	-,309	-,254
AffectiveConfiguration	12,78	2,02	-,004	-,476
CognitiveConfiguration	11,58	3,44	,026	-,708
SleepProblems	8,27	3,21	-,439	-,978
DSTDBÖ	61,96	12,17	-,456	-,405

According to Table 3, while there were significant differences in the emotional irritability and emotional configuration sub-dimensions in evaluating the degree of post-earthquake trauma ($p<0.05$), there was no possible difference in the other sub-dimensions ($p >0.05$). The study revealed that this difference determined by the emotional structure and emotional configuration sub-dimensions was in favor of women, whose average expectations were higher than those of men.

Table 3. t-test results regarding the sub-dimensions of post-earthquake trauma level of students according to gender

Alt Dimensions	Gender	N	$\bar{x}$	ss	t	p
Behavior Problems	Woman	148	13,01	2,64	,31	,75
	Male	127	12,91	2,25		
Excitement Limitation	Woman	148	16,61	2,95	1,92	,02*
	Male	127	15,91	3,10		
Affective Configuration	Woman	148	13,12	2,42	2,11	,02*
	Male	127	12,51	2,36		
Cognitive Configuration	Woman	148	11,85	3,22	1,36	,17
	Male	127	11,28	3,68		
Sleep Problems	Woman	148	8,33	2,94	,30	,76
	Male	127	8,21	3,52		
DSTDBÖ	Woman	148	62,92	11,64	1,42	,15
	Male	127	60,83	12,71		

*p<0.05

When Table 4 is examined, no significant difference was observed in the post-earthquake trauma levels of the participants according to the department of education variable.

Table 4. ANOVA Test results for the sub-dimensions of post-earthquake trauma level according to the department of the students

Sub Dimensions	Section	N	$\bar{x}$	ss	F	p
Behavior Problems	School of Physical Education and Sports	141	13,02	2,27	,57	,68
	Faculty of Health Sciences	103	12,77	2,72		
	Faculty of Education	22	13,60	2,20		
	Faculty of Science and Letters	7	12,71	2,50		
	Faculty of Forestry	2	12,50	6,36		
Excitement Limitation	School of Physical Education and Sports	141	16,45	2,98	1,50	,20
	Faculty of Health Sciences	103	16,20	2,83		
	Faculty of Education	22	15,73	4,06		
	Faculty of Science and Letters	7	17,29	2,69		
	Faculty of Forestry	2	12,00	4,24		
Affective Configuration	School of Physical Education and Sports	141	13,07	2,24	1,13	,34
	Faculty of Health Sciences	103	12,61	2,47		
	Faculty of Education	22	12,18	2,94		
	Faculty of Science and Letters	7	13,57	1,81		
	Faculty of Forestry	2	13,00	5,65		
Cognitive Configuration	School of Physical Education and Sports	141	11,73	3,45	,31	,87
	Faculty of Health Sciences	103	11,52	3,41		
	Faculty of Education	22	11,32	3,40		
	Faculty of Science and Letters	7	11,14	4,41		
	Faculty of Forestry	2	9,50	4,95		
SleepProblems	School of Physical Education and Sports	141	8,49	3,20	,60	,66
	Faculty of Health Sciences	103	8,19	3,18		
	Faculty of Education	22	7,73	3,17		
	Faculty of Science and Letters	7	7,43	4,20		
	Faculty of Forestry	2	6,50	4,95		
DSTDBÖ	School of Physical Education and Sports	141	62,77	11,72	,54	,70
	Faculty of Health Sciences	103	60,54	12,73		
	Faculty of Education	22	53,50	26,16		
	Faculty of Science and Letters	7	61,30	12,47		
	Faculty of Forestry	2	62,14	13,27		

When Table 5 is examined, a significant difference was found in the post-earthquake trauma levels of the participants according to the class variable in which they were educated, and according to the result of the Post Hoc Test for the determination of the source of the difference, it was found that the relevant difference was between the 2nd and 4th grades and the 3rd grade

Table 5. ANOVA Test results for the sub-dimensions of post-earthquake trauma level according tostudents'grades

Sub Dimensions	Classroom	N	$\bar{x}$	ss	F	p	Bonferonni
Behavior Problems	1st grade	25	12,92	3,24	1,57	,20	-
	2nd grade	31	12,71	2,30			
	3rd grade	121	12,69	2,12			
	4th grade	98	13,39	2,66			
Excitement Limitation	1st grade	25	16,08	3,15	,16	,92	-
	2nd grade	31	16,61	3,06			
	3rd grade	121	16,26	3,34			
	4th grade	98	16,28	2,62			
Affective Configuration	1st grade	25	12,52	2,28	,52	,67	-
	2nd grade	31	12,48	2,50			
	3rd grade	121	12,87	2,46			
	4th grade	98	13,00	2,36			
Cognitive Configuration	1st grade	25	11,96	4,21	,53	,66	-
	2nd grade	31	12,06	3,21			
	3rd grade	121	11,33	3,55			
	4th grade	98	11,66	3,18			
Sleep Problems	1st grade	25	8,88	3,69	3,31	,02 *	2,4>3
	2nd grade	31	9,03	2,69			
	3rd grade	121	7,60	3,32			
	4th grade	98	8,71	2,99			
DSTDBÖ	1st grade	25	62,36	15,09	,71	,54	-
	2nd grade	31	62,90	11,47			
	3rd grade	121	60,76	12,38			
	4th grade	98	63,04	11,33			

DISCUSSION

On February 6, 2023, the earthquake, which deeply affected 13 provinces in our country, negatively affected individuals in many ways. As a result of these negativities, our research aims to determine the post-earthquake trauma levels of university students exposed to earthquake and to reveal the effect of recreational sports activities on their social, physical and psychological recovery.

Our study revealed that university students who experienced earthquakes had high levels of post-earthquake trauma. A possible explanation for this may be the occurrence of two major earthquakes in Kahramanmaraş on the same day, followed by a 6.4-magnitude earthquake in Hatay's Defne district and the continuation of aftershocks. According to Çelik (2023), participants who experienced the earthquake in Pazarcık and Elbistan districts of Kahramanmaraş also showed high levels of post-earthquake trauma symptoms. Abolhadi et al. (2022) conducted a study almost 20 years after the earthquake and reached a similar conclusion that the participants had high levels of post-earthquake stress. In addition, Baral and Bhagawati (2019) concluded that individuals exposed to the Nepal earthquake experienced high levels of post-earthquake stress. Previous studies in Europe, Asia and Latin America have also shown that natural disasters, including earthquakes, cause posttraumatic stress disorder in 5% to 60% of individuals (Cairo et al., 2010). Different from our study, Kardaş and Tanhan (2018) investigated the Posttraumatic Stress Levels of University Students Who Experienced Van Earthquake. Their findings concluded that the

trauma levels of the participants were low. This result may be attributed to the fact that the study was conducted approximately 6 years after the earthquake.

The study revealed that there was a significant difference between the genders of the participants in the emotional irritability and emotional restructuring dimensions, which are the sub-dimensions used to measure the level of trauma left after the earthquake. This difference was observed in both emotional and emotional restructuring levels, with women experiencing more trauma than men. Dell'Osso et al. (2013) conducted research on the levels of trauma experienced by participants after the 2009 L'Aquila earthquake and concluded that female participants experienced higher levels of trauma than male participants. Similar findings have been documented in the literature (Baral and Bhagawati, 2019; Flores et al., 2014; Hacıoğlu et al., 2002). Atılgan examined the levels of post-traumatic stress experienced by survivors of the Van- Erciş earthquake in 2016. The study showed that female participants had higher levels of emotional irritability compared to their male counterparts. However, our study revealed different results in terms of behavioral problems, affective restructuring, cognitive restructuring and sleep problems. Although our study had parallel results with Atılgan's study, there were also dimensions that did not overlap. Similarly, Abolhadi et al. (2022) found that gender was not a significant variable in the development of posttraumatic stress disorder among survivors of the 2003 earthquake in Iran. Possible reasons for these different findings include the multiple earthquakes on February 6, 2023 and the subsequent aftershocks, loss of life and difficulties in meeting basic needs.

In the analysis, it is seen that there is no significant difference between the degree of trauma experienced by the participants after the earthquake according to the departments they study. In the literature review, no study investigating the relationship between the department and post-earthquake trauma levels was found. Our study aims to fill this gap in the literature and shed more light on this aspect of trauma research. Considering the education level variable, a significant difference was found between the participants' grade and the sub-dimension of sleep problems. The results showed that students in the 2nd and 4th grades had higher levels of sleep problems than those in the 3rd grade. Although there is a lack of research examining the relationship between class level and post- earthquake trauma levels, there are studies investigating the relationship between age and age level. In their study conducted in 2009, Dell'Osso et al. (2013) concluded that as the age level of the participants increased, their trauma levels also increased. Similar findings have been documented in previous literature (Abolhadi et al. 2022; Baral & Bhagawati, 2019).

• Our research was conducted with Artvin Çoruh University students. In future studies, students studying in the earthquake zone can also be included and comparisons can be made.

• Although the earthquake directly affected 13 provinces, the magnitude of the earthquake and the high number of casualties affected almost everyone in our country. Therefore, research can be conducted on the trauma levels of students who have and have not experienced an earthquake.

• Research can be conducted on what should be done to reduce the level of post- earthquake trauma, such as interviews with students caught in the earthquake.

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Conflict of Interest

No conflict of interest is declared by the authors. In addition, no financial support was received.

Ethics Statement

Before proceeding with the data collection phase of this research, ethical permission was obtained from the Ethics Committee of Artvin Çoruh University, dated 03.04.2023 and numbered E-18457941-050.99-87288.

Author Contributions

The authors contributed equally.

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