International Journal of Educational Research Review

Investigating Earthquake Anxiety Levels of Child Development Department University Student

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Article History:
Received 24.07.2023
Received in revised form 13.10.2023
Accepted
Available online 15.10.2023

After the February 6 earthquakes in 2023 in the South-east of Turkey, this study, which was conducted to examine the earthquake anxiety levels of students of child development according to various variables, is a survey model. The study population consists of university students of the child development department. The study sample consists of 212 students who volunteered to participate in the study at Akdeniz University and Osmaniye Korkut Ata University in the program of child development. The data were collected online through the Personal Information Form and Earthquake Anxiety Scale (Bal & Akgül, 2023). As a result of the study, it was determined that the earthquake anxiety levels of students in child development differed significantly according to gender, age, being in one of the provinces affected by the earthquake, losing a relative in the earthquake, and the destruction of their houses. During the February 6 earthquakes, it was found that the earthquake anxiety levels of child development students who were in one of the provinces affected by the earthquake, whose houses were destroyed and who lost their relatives in the earthquake, who were girl and 19 years of age or older was higher, than the others. It was determined that the earthquake anxiety levels of students of child development did not differ significantly depending on the grade level and the type of graduated high school.

Keywords: February 6 earthquake, earthquake anxiety, child development

INTRODUCTION

An "earthquake" is the shaking of the earth when the vibrations that suddenly occur due to the fractures in the earth's crust spread in waves and shake the earth. The 7.7 and 7.6 magnitude earthquakes that occurred at 04.16 o'clock and 13.23 o'clock on February 6, 2023, were centered in Pazarcık and Elbistan and were felt in many provinces of Turkey. The February 6 earthquakes were recorded as one of the largest earthquakes of the last century in terms of its magnitude, the extent of the area it affected, and the material losses it caused. It was called the "catastrophe of the century". According to Gerstner et al. (2020), earthquakes permanently or temporarily damage people physically and psychologically. In the physical context, people may lose their homes or workplaces or suffer from injuries and disabilities. Psychologically, they may be deeply affected and become anxious and stressed (Kotozaki & Kawashima, 2012). Psychological problems such as depression and anxiety are highly prevalent in earthquake victims (Zhang et al., 2011).

The disorders that may occur in individuals after an earthquake are analyzed under four headings, which are: social, emotional, mental, and physical (Güvercin, 2006): Emotional disorders: These are the disorders in which the individual feels shock, fear, anger, guilt, shame, helplessness, unhappiness, and freezing. Mental disorders are the disorders in which the individual forgets where and when they are and experiences confusion and distraction. Physical disturbances: These are the disorders in which the individual experiences physical problems such as tension, fatigue, difficulty sleeping, physical pains, feeling of illness, heart problems, headaches, sudden startles, and shortness of breath. Social disorders: These include restlessness, insecurity, withdrawal from people, feeling rejected, and being overly judgmental.

As long as the level of anxiety experienced at first does not decrease, it can become a severe mental health problem in adults and children (Valladares-Garrido., et al., 2022). Anxiety is an unpleasant, vague feeling of danger, often accompanied by autonomic symptoms (Geçtan, 2002) and a disturbing and unpleasant emotional condition that every individual encounters in certain periods of their lives (Şahin & Uçar Çabuk, 2022). Persistent anxiety symptoms in adolescents may increase the risk of developing other psychological problems later in life (Anyan et al., 2018; Hausman et al., 2018; Starr et al., 2016; Stein et al., 2001), which may lead to suicidal ideation (Bentley et al., 2016; San Too et al., 2019) and long-term adverse effects (de Lijster et al., 2018; Martin et al., 2019). Anxiety experienced after an earthquake also negatively affects individuals' further years. The studies show that people exposed to such natural disasters cannot get rid of the effects of

the event even years later and experience psychological problems (Rubonis & Bickman, 1991; Alkan, 1999; Özçetin et al., 2008).

Earthquakes also cause some adverse effects on education services. These effects can be seen as damage to the physical environment in which educational services are carried out and the problems of students and instructors who experience the earthquake (Yıldız, 2000). The review of the related literature indicates that there are various studies investigating the effects of earthquakes on children, youth, and adults (Adhikari et al., 2021; Flander et al., 2021; Karancı, 1999; Okuyama, 2021; Özçetin et al., 2008; Özgelet & Utkucu, 2021; Öztürk, 2013; Sabuncuoğlu et al., 2003; Stratta et al., 2013; Tang et al., 2020; Ying et al., 2013; Zhang et al, 2011). It was seen that the studies examining the earthquake awareness of teachers and pre-service teachers (Bilen & Polat, 2022), earthquake preparedness, and post-earthquake emotional states of O'Toole (2017) were limited. After the 6 February earthquakes, various studies conducted with teachers, school principals and mothers with preschool children in the provinces affected by the earthquake emerged. Besides, after the 6 February earthquakes, there appeared the studies examining the state anxiety levels of primary school teachers (Karaarslan, 2023), job satisfaction levels of teachers working in the earthquake zone (Genç et al., 2023), earthquake anxiety and well-being of mothers with preschool children (Uçar Çabuk, 2023), and the problems faced by school principals in schools after the 6 February earthquake (Arslan, 2023). However, no study has examined the earthquake anxiety levels of child development associate degree students yet who are the candidates for child development professionals.

Given the large-scale damage that earthquakes cause to people's homes, lives, and economic status, post-earthquake intervention is important and impactful (Ezaki, 2018; Okuyama, 2021). The adolescents affected by disasters need mental health support as they are at risk of developing psychiatric disorders and stress as adults (Okuyama, 2021). The February 6 earthquakes, which affected thousands of people, took place recently, and it is thought that there is a need for the studies revealing the anxiety states of individuals after the earthquake. Necessary measures can be taken based on the findings of the studies. In this context, in this study, it is anticipated that determining the earthquake anxiety levels of child development associate degree students who directly interact with children will contribute to the literature. Children can act similarly by observing and modeling adults' emotional states, anxieties and how they manage them. In this respect, any study aimed at supporting adults by investigating the anxiety of all adults interacting with children and the variables affecting them will be reflected in children.

The primary purpose of this study is to examine the earthquake anxiety levels of child development associate degree students according to various variables after the February 6 earthquakes. In line with this primary purpose, the answers to the following research questions will be investigated:

Do the earthquake anxiety levels of child development students differ significantly according to age, gender, grade level, and type of high school they graduated from?

Do the earthquake anxiety levels of child development students differ significantly according to being in one of the provinces affected by the earthquake, losing a relative in the earthquake, and destroying their houses?

METHOD

This research is a descriptive study based on the survey model. According to Karasar (2005), the survey model aims to describe a past or ongoing situation as it exists. This study described the depression anxiety levels of associate degree students of child development.

Research Sample

The study population consists of associate degree students of child development department. The study sample consisted of 212 students who volunteered to participate in the study at Akdeniz University and Osmaniye Korkut Ata University in the associate degree programs of child development. The reason for selecting the students from these two universities was that it was thought that most of the students in Osmaniye would be in the provinces affected by the earthquake, while the students in Antalya would be in the provinces that were not affected by the earthquake. Personal information about the students is given in Table 1.

Table 1. *Personal information about the students*

Variables		N	%
Age	18 years and under	117	55,1
	Over 19 years old	95	44,9
Gender	Female	195	92,0
	Male	17	8,0
Grade Level	1st Class	115	54,2
	2nd Class	97	45,8
Graduated high school	Anatolian High School	107	50,5
	Vocational High School (Child Development)	70	33,0
	Other	35	16,5
Being in one of the provinces affected by the earthquake	Yes	99	46,7
	No	113	53,3
Destruction of the house	Destroyed	12	5,7
	Undestroyed	200	94,3
Loss of a loved one in the earthquake	Yes	76	35,8
	No	136	64,2

Data Collection Tools and Procedure

The data of the study were collected through Personal Information Form and Earthquake Anxiety Scale. The form prepared online with Google.doc was sent to the participants via Whatsapp and e-mail between May 10-17, 2023. The students who volunteered to participate in the study completed the form.

Personal Information Form: It consists of the questions such as gender, age, class, and province where child development associate degree students were located on February 6.

Earthquake Anxiety Scale: The scale was developed by Bal & Akgül (2023) to measure earthquake anxiety. The lowest score obtained from the one-factor scale consisting of 34 items in total is 34, and the highest score is 170. High scores on the scale indicate high earthquake anxiety, while low scores indicate low earthquake anxiety. The Cronbach Alpha reliability method was used to measure the scale's reliability, and the alpha value was determined as 0.998. In order to measure the internal consistency of the Earthquake Anxiety Scale, the Two-Half, Spearman-Brown, and Guttman Methods were used. It is seen that the Cronbach's Alpha of the 18 items in the first part of the Earthquake Anxiety Scale is .89, and the Cronbach's Alpha of the 18 items in the second part is .90. These results show that the reliability levels of both halves of the scale are high (Bal & Akgül, 2023). There is no reverse coding in the scale items.

Data Analysis

The data of the study were analyzed through SPPS 23.0 package program. The statistics such as percentage and frequency are given in tables. Skewness and kurtosis values were evaluated between-1.5 and +1.5 to determine the normal distribution of the data (Tabachnick & Fidell, 2018). Since all data were in this range, it was accepted that they showed normal distribution. Independent Samples T Test was used to determine the differences in child development associate degree students' earthquake anxiety levels depending on the variables of gender, age, grade level, being in one of the provinces affected by the earthquake, losing a relative in the earthquake, and the destruction of their houses. One-Way Analysis of Variance (ANOVA) was used to detect the differences depending on the high school graduate.

RESULTS

This section of the study presents a statistical analysis of the data collected about the variables examined and the findings obtained from these analyses.

Table 2. *Independent Samples t Test Analysis Results Regarding the Scores Received from the Earthquake Anxiety Scale According to the Gender of Child Development Associate Degree Students*

Gender	N	$\bar{x}$	SS	t	sd	P
Female	195	121,88	25,10	2,949	210	0,004*
Male	17	102,53	34,53			
Total	212					

According to Table 2, the mean scores of child development associate degree students on the earthquake anxiety scale differ significantly depending on gender (t= 2,949, sd=210 p=0,004). The mean scores of female child development associate degree students on the earthquake anxiety scale are significantly higher than the mean scores of male students. In other words, female child development associate degree students have more earthquake anxiety than male students.

Table 3. *Independent Samples t Test Analysis Results Regarding the Scores Received from the Earthquake Anxiety Scale According to the Age of Child Development Associate Degree Students*

Age	N	$\bar{x}$	SS	t	sd	p
18 years and under	117	117,06	25,97	-2,012	210	0,046*
19 years and older	95	124,35	26,53			
Total	212					

Table 3 reveals that the mean scores of child development associate degree students on the earthquake anxiety scale show a significant difference depending on age (t= -2,012, sd=210 p=0,046). The mean scores of 19 years old and above associate degree students in child development on the earthquake anxiety scale are significantly higher than the mean scores of 18 years old and under. In other words, child development associate degree students aged 19 and over have more earthquake anxiety than the students aged 18 and under.

Table 4. *Independent Samples t Test Analysis Results Regarding the Scores Received from the Earthquake Anxiety Scale According to the Grade Levels of Child Development Associate Degree Students*

Grade Level	N	$\bar{x}$	SS	t	sd	p
1st grade	115	121,52	24,72	,717	210	0,474
2nd grade	97	118,91	28,35			
Total	212					

Considering the findings displayed in Table 4, the mean scores of child development associate degree students on the earthquake anxiety scale do not significantly differ depending on the grade level (t=,717, sd=210 p=0,474).

Table 5. *ANOVA Results Regarding the Scores Received from the Earthquake Anxiety Scale According to the Type of High School Graduated by Child Development Associate Degree Students*

Source of variance	Sum of Squares	Mean of Squares	sd	F	p
Between Groups	1250,611	625,306	209	,895	0,410
Within Groups	145945,931	698,306			
Total	147196,542				

It is explicit in Table 5 that the mean scores of child development associate degree students from the earthquake anxiety scale do not differ significantly depending on the type of high school they graduated from (F=,895, sd=219 p=0,410).

Table 6. *Independent Samples t Test Analysis Results Regarding the Scores Received from the Earthquake Anxiety Scale by Child Development Associate Degree Students According to Being in One of the provinces affected by the Earthquake*

Gender	N	$\bar{x}$	SD	t	sd	p
Yes	99	112,17	27,02	-4,339	210	0,000*
No.	113	127,33	23,85			
Total	212					

According to Table 6, the mean scores of associate degree students in child development on the earthquake anxiety scale differ significantly depending on being in one of the provinces affected by the earthquake (t= -4,339, sd=210 p=0,000). The mean scores of child development associate degree students who were in one of the provinces affected by the earthquake during the earthquake were significantly higher than the mean scores of students who were not in such a case. In other words, child development associate degree students

who were in one of the provinces affected by the earthquake during the earthquake had more earthquake anxiety than the students who were not in one of the provinces affected by the earthquake.

Table 7. *Independent Samples t Test Analysis Results Regarding the Scores of Child Development Associate Degree Students on the Earthquake Anxiety Scale According to the Destruction of Their Houses*

	N	$\bar{x}$	SD	t	sd	p
House Destroyed	12	136,67	31,17	2,227	210	0,027*
House Not Destroyed	200	119,35	25,86			
Total	212					

Table 7 displays that the mean scores of child development associate undergraduate students on the earthquake anxiety scale differ significantly depending on whether their houses were destroyed in the earthquake (t= 2,227, sd=210 p=0,027). The mean scores of child development associate degree students whose houses were destroyed in the earthquake are significantly higher than the mean scores of the students whose houses were not destroyed. In other words, child development associate degree students whose houses were destroyed in the earthquake have more earthquake anxiety than the students whose houses were not destroyed in the earthquake.

Table 8. *Independent Samples t Test Analysis Results Regarding the Scores Received from the Earthquake Anxiety Scale by Child Development Associate Degree Students According to the Status of Losing a Relative in the Earthquake*

	N	$\bar{x}$	SD	t	sd	p
Lost a relative	76	130,49	24,71	4,363	210	0,000*
Did not lose a relative	136	114,65	25,70			
Total	212					

According to Table 8, the mean scores of child development associate degree students on the earthquake anxiety scale show a significant difference depending on whether they lost a relative in the earthquake (t= 4,363, sd=210 p=0,000). The mean scores of child development associate degree students who lost a relative in the earthquake are significantly higher than those who did not lose a relative in the earthquake. In other words, child development associate degree students who lost a relative in the earthquake have more earthquake anxiety than the students who did notexperience such an awful situation.

CONCLUSION and DISCUSSION

This study was conducted with 212 child development associate degree students to examine the earthquake anxiety of child development associate degree students according to various variables after the February 6 earthquakes. As a result of the study, it was observed that the mean scores of associate degree students in child development from the earthquake anxiety scale differed significantly depending on gender, and female associate degree students in child development had more earthquake anxiety than male students. Similar to the findings of this study, Sabuncuoğlu et al. (2003) found that girls had higher situational anxiety than boys in their research with young people who had experienced the Marmara earthquake, and Tang et al. (2020) found that women were more anxious than men after the earthquake. In a study conducted by Zhang et al. (2011) with children and adolescents, it was figured out that girls felt more vulnerable after the earthquake and were more affected by the earthquake. Stratta et al. (2013) detected that women affected by the earthquake had more suicidal thoughts. Kaya & Varol (2004) examined the state-trait anxiety levels of theology faculty students and found that the trait anxiety levels of female students were higher than male students. It is stated that girls are more prone to post-traumatic stress symptoms than boys (Furr vd., 2010; Tolin & Foa, 2008).

It was uncovered that the earthquake anxiety of associate degree students differed significantly depending on age. Child development associate degree students aged 19 and over had more earthquake anxiety than the students aged 18 and under. In contrast to this finding, in the study of Ulukoca et al. (2017), in which university students' attitudes towards earthquake were examined, it was ascertained that there was no significant difference between the students' attitude scores towards earthquakes and their age levels.

It was determined that the mean scores of child development associate degree students from the earthquake anxiety scale did not differ significantly depending on the grade level and the type of high school graduate. Similar to this finding, Kaya & Varol (2004) found no significant difference between the anxiety levels of the students and the grade level in their study conducted with theology faculty students.

It was found out that the mean scores of associate degree students in child development from the earthquake anxiety scale showed a significant difference depending on being in one of the provinces affected by the earthquake. Child development associate degree students who were in one of the provinces affected by the

earthquake during the earthquake had more earthquake anxiety than the students who were not in one of the provinces affected by the earthquake. This finding is an expected one. A study conducted after the Erzincan earthquake revealed that the people who experienced the earthquake were more nervous and tense than the ones who did not experience the earthquake (Karancı, 1999). In Karakuş's (2013) study examining the metaphors of 12th-grade students who had and had not experienced the earthquake, it was observed that the students who had not experienced the earthquake produced 26 different metaphors about the earthquake, while the students having experienced the earthquake created 44 metaphors. The earthquake's experience explained that the students who experienced the earthquake produced more metaphors. Doğan et al. (2023) examined the attitudes of pre-service social studies teachers toward disasters. They uncovered that the average scores of those who were exposed to any disaster were higher than the average scores of those who were not exposed to any disaster. Kitayama et al. (2000) found that after the Hanshin-Awaji earthquake, the children living in areas severely affected by the earthquake exhibited more post-traumatic stress disorder symptoms than the children residing in moderately affected areas. During the 1988 earthquake in Armenia, it was found that children living in the city that was the earthquake's epicenter were most affected psychologically, while children living in the most distant cities were less affected (Goenjian et al., 1995).

In the study, it was ascertained that the mean scores of child development associate degree students from the earthquake anxiety scale showed a significant difference depending on the destruction of their houses in the earthquake. Child development associate degree students whose houses were destroyed in the earthquake had more earthquake anxiety than the students whose houses were not destroyed. In parallel with this finding, in the study of Tang et al. (2020), the adolescents who were more exposed to the effects of the earthquake were more anxious than those who were not. The study of Zhang et al. (2011) with children and adolescents determined that the earthquake's effects increased as the exposure level increased. In a study conducted by Zheng et al. (2019), earthquake survivors' attachment to their living place was examined. Due to various factors, people prefer to move from that region after an earthquake. However, some people prefer to live where they are. In the study, it was found that the people who were greatly affected by the earthquake tended to leave their place of residence more. However, it was observed that the people who preferred to stay where they were were more successful in coping with the devastating effects of the earthquake.

The mean scores of child development associate undergraduate students from the earthquake anxiety scale showed a significant difference depending on the status of losing a relative in the earthquake. It was observed that associate degree students of child development who lost a relative in the earthquake had more earthquake anxiety compared to the students who did not lose a relative in the earthquake. Nakajima (2012) stated that most people accept the world as a safe place because they have not encountered such a traumatic trauma before the earthquake experience, and they do not think that the people close to them can suddenly die. Since it is very difficult for human psychology to adapt to the sudden change that occurs after an earthquake at the same speed, she stated that the loss-based situations created by the earthquake would create different emotional states. One of the important events experienced during the earthquake is that people experience fear and panic, and worry about their relatives. The thoughts that cause anxiety can manifest themselves in different ways. While some fear losing their relatives, others may worry about their lives. According to Nakajima (2012), such mental problems are more common in the cases where someone in the family dies; their homes are destroyed, and witnessing the transportation of the wounded and dead with the relief efforts during the earthquake (Bermunt et al., 1999). This study revealed that associate degree students of child development whose houses were destroyed and who lost a relative in the earthquake had more earthquake anxiety. According to Adhikari et al.'s (2021) research on the Nepal earthquake, the study on Nepalese-speaking immigrants living in the United States determined that immigrants were also affected by the earthquake and showed symptoms of post-traumatic stress disorder and depression. The importance of familial and social support in coping with this has been revealed. Even if not directly exposed to the earthquake, the loss of a relative in the earthquake is thought to increase the adverse effects of the earthquake.

In this study, earthquake anxiety levels of associate degree students of child development were investigated with various variables. Children's earthquake anxiety was not addressed in the dtudy. Although behavioral changes shown by children against natural disasters differ from adults' disaster behaviors, the traces of adults' disaster reactions are observed in children (Pfefferbaum et al. 2008). According to De Janvry et al. (2006), natural disasters have a more severe impact on children, including primary school children, indigenous children, the children of agricultural workers, and girls. Terr (1983) found out that after a single traumatic

event, all children experience post-traumatic effects even 4 years later. Long-term effects include trauma dreams, repeated recollection of the trauma, pessimism about the future, fear of future traumas, reminiscence, and reliving. It is thought that determining the earthquake anxiety of child development associate degree students will help prevent and support psychological problems that may be seen in them. Thus, the graduate child development students will have more positive interactions with the children they will guide and accompany.

The fact that the earthquake phenomenon is embedded in people's subconscious may manifest as short and long-term psychological disorders (Köknel, 1995). Özçetin et al. (2008) conducted a study on 62 patients over 18 who showed the signs of post-traumatic stress disorder after the earthquakes and found that 35% of the patients showed personality disorders. The emergence of such situations after an earthquake is inevitable (Karancı, 1999). Personality characteristics of individuals and, more importantly, the support they receive from their relatives and the society they live in after the disaster is of great importance in whether a psychiatric disorder occurs. Depression, extreme distress disorder, adjustment disorder, acute stress, and post-traumatic stress disorder are mental disorders seen in children and adolescents after an earthquake. Such mental problems are more common in the cases where a family member died, their house was destroyed, and they witnessed the transportation of the wounded and the dead during the earthquake (Bermunt et al., 1999). Özgelet & Utkucu (2021) examined the variables that effectively cope psychologically with the devastating effects of the earthquake using the review method. They listed the prominent factors in dealing with the disastrous consequences of the earthquake as family support, religious belief, and social support. In the study of Eray et al. (2017), in which the adolescents affected by the Van earthquake were analyzed regarding relocation and social support, it was revealed that relocation was not effective in coping. Still, the support provided by the family was adequate. As a result of this study, it was determined that the most affected group by the earthquake was the people who lived in the cities where the earthquake occurred, whose houses were destroyed, and who lost their relatives. This result reveals the importance of psychological support for the individuals affected by the earthquake. Some studies conducted with teachers and pre-service teachers also show that teachers and pre-service teachers have earthquake anxiety and are not prepared for earthquakes. For example, in a qualitative study conducted by O'Toole (2017) with teachers who experienced the New Zealand earthquake, it was found that one of the teachers' most frequently expressed emotions after the earthquake was anxiety. In the study conducted by Öztürk (2013), it was observed that although all pre-service teachers were directly or indirectly affected by the earthquake, they were not prepared for an earthquake that may occur later depending on the time that passed after the earthquake.

SUGGESTIONS

Further studies can be conducted to determine the earthquake anxiety of preschool teachers, prospective teachers, and preschool children. Also prospective studies can be conducted to examine the relationship between the earthquake anxiety of preschool children and the earthquake anxiety of their teachers or parents. In addition, future studies can be conducted to determine earthquake anxieties and post-earthquake emotions through interviews and observations. In order to reduce individuals' earthquake anxiety, it is recommended to provide training on earthquake preparedness and to provide psychological support after earthquakes.

It is anticipated that making the necessary legal arrangements for buildings to be earthquake-resistant before earthquakes occur and applying the required sanctions by complying with these legal regulations will make individuals feel safer and reduce their earthquake anxiety. Situations such as the collapse of a house and the loss of a relative in an earthquake increase earthquake anxiety. In this respect, taking necessary precautions before the earthquake occurs is recommended. Last but not least, further studies can be carried out to shed lights on the predictors of earthquake anxiety.

Declarations

Conflict of Interest

No potential conflicts of interest were disclosed by the author(s) with respect to the research, authorship, or publication of this article.

Ethics Approval

The formal ethics approval was granted by the Osmaniye Korkut Ata University Social Sciences Scientific Research and Publication Ethics Committee. We conducted the study in accordance with the Helsinki Declaration in 1975.

Funding

No specific grant was given to this research by funding organizations in the public, commercial, or not-for-profit sectors.

Research and Publication Ethics Statement

Before the research, ethics committee permission was obtained from Osmaniye Korkut Ata University Social Sciences Scientific Research and Publication Ethics Committee (Decision dated 09.05.2023 and numbered 2023/5/9). The participants answered the scale after approving the informed consent form. The participants were not asked for their e-mail addresses, identity information, etc., by paying attention to the principle of confidentiality and privacy.

Hereby, we, as the authors, consciously assure that for the manuscript the following is fulfilled:

- This material is the authors' own original work, which has not been previously published elsewhere.
- The paper reflects the authors' own research and analysis in a truthful and complete manner.
- The results are appropriately placed in the context of prior and existing research.
- All sources used are properly disclosed.

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