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Children After Earthquake: Maraş Earthquake in Türkiye

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Abstract

Türkiye has experienced the most destructive earthquake disaster in recent years. On February 6, 2023, two earthquakes of more than seven magnitudes occurred in Türkiye, first in Pazarcık and then in Elbistan districts of Kahramanmaraş province. These earthquakes caused the deaths of more than 50 thousand people and billions of dollars in damage. The earthquakes had serious effects on every segment of society, including children. This study, which aimed to examine the opinions of individuals about children in such a big earthquake, examined 3.450 tweets sent in February 2023. While the researchers used Maxqda to analyze tweets regarding hashtags, likes, retweets, and source devices, they used Python for sentiment analysis. The findings highlighted that the words AFAD (Disaster and Emergency Management Presidency), education, and psychology were frequently used as hashtags in tweets about children. In addition, the study observed that tweets with very few likes and retweets did not arouse much interest in people. The findings of the sentiment analysis indicated that the tweets were quite negatively oriented. The study's findings can guide future actions and plans concerning the earthquake and children.

Keywords: Earthquake, children, Maraş Earthquake, Twitter, sentiment analysis.

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1. Introduction

Ergünay (2009) defines disasters as events that cause physical, economic, and social losses for people, affect communities by stopping or interrupting normal life and human activities, and are caused by natural, technological, and human-induced factors. If natural events on earth cause loss of life and property, they become disasters (Değirmenci & İlter, 2013). In this context, while earthquakes are natural events, they turn into natural disasters with the human factor. Undoubtedly, children are the most affected by this natural disaster. Türkiye has experienced the most destructive earthquake disaster in recent years. On February 6, 2023, two earthquakes with a magnitude of more than seven occurred in Türkiye, first in Pazarcık and then in Elbistan districts of Kahramanmaraş province. In Türkiye, this earthquake is called the Maraş Earthquake. This earthquake, which took place in Türkiye on February 6, 2023, affected eleven provinces of the country and turned into a natural disaster by causing the loss of life and property of thousands of people.

The literature on natural disasters has focused on the naturalness of natural disasters (i.e., İnmez, 2011) and the health problems experienced by people after natural disasters (i.e., Çakmak et al., 2018; Kukuoğlu, 2018; Mahmoudi-Gharaei et al., 2006; Pun et al., 2022; Usami et al., 2012). Children are the most affected by natural disasters because they do not have enough skills, experience, and maturity to understand and cope with the damage of natural disasters, and children in early childhood are more affected by natural disasters due to their development (Erkan, 2010; Park, 2018; Tanaka, 2016). Children are especially vulnerable during natural disasters and experience increasing physical and mental health problems and educational processes after natural disasters (Lai & La Greca, 2020). The relevant literature on the effects of natural disasters on children has focused on the effects of natural disasters on children's health (i.e., Danışman & Okay, 2017; Deering, 2000; Kaya & Özcebe, 2013), the mental state of children after natural disasters (i.e., Ak, 2002; Ataç & Özsever, 2021; Berkem & Bildik, 2001; Erkan, 2010; Osofsky et al., 2009; Scheeringa & Zeanah, 2008), and children's awareness of natural disasters (i.e., Doğan & Kırkıncıoğlu, 2020; Sapsağlam, 2019; Tuncer et al., 2021).

In natural disasters, media and social platforms are actively used to cooperate and inform official institutions and other people. The relevant literature is rich in terms of the use of social platforms in natural disasters. Garske et al. (2021) investigated the spatial distribution of negative emotional expressions of Twitter users before, during, and after Superstorm Sandy in New York City in 2012. In his study, in which he focused on the important spatial relationships between negative emotional expressions in tweets and socio-economic status and infrastructure damage, Kaigo (2012) drew attention to the use of the Twitter platform during the 2011 Great East Japan Earthquake in his study titled "Social Media Usage During Disasters and Social Capital." He stated that the Tsukuba Municipality used Twitter to inform the citizens about the earthquake and to disseminate this information, and in this respect, the Twitter platform played an important role in disseminating vital information. In another study entitled *Social Media in Japan and the Great Eastern Japan Earthquake*, Kaigo (2017) conducted a detailed study on how Twitter, one of the social media platforms, was used in the Japan earthquake. Soydan and Alpaslan (2014) drew attention to the power of informing society regarding the precautions to be taken before the disaster since the media appeals to a wide audience in their study titled "Role of Media Acts in Natural Disasters." In addition to these studies, studies on how natural disasters affect children are covered in the media. Karataş (2022) investigated the news in the media about children after the earthquake disaster that

took place on October 30, 2020, in the Seferihisar district of Izmir, Türkiye, using discourse analysis with a focus on children's rights. Similarly, Usta and Yükseler (2021) investigated the Izmir Earthquake regarding the use of social media in disasters and ethical principles.

In addition to the media, social platforms are also actively used today. One of the most actively used microblogging platforms in Türkiye is Twitter. Thanks to its wide user network, Twitter is used more effectively than other websites in the rapid dissemination of information in natural disasters (Oh et al., 2010; Kaigo, 2012). Twitter serves as a source not only because information can spread rapidly but also because media companies follow Twitter and display these tweets or the pictures shared on TwitPic as a news source (O'Connor, 2009). In their study titled "How Can Indonesia Government Handle the Natural Disaster During COVID-19 Pandemic: Analysis of Twitter Account," Subekti et al. (2022) concluded that the National Disaster Management Board was more active on Twitter than the National Search and Rescue Agency in 2020. White (2010) reported that Twitter helped share the severity and extent of a disaster effectively by linking documents and images and sharing the person's location via mobile devices. In addition, information shared on Twitter is published almost in real time, so that information can be retransmitted to government agencies and rescue teams during crises. For this reason, the current study aimed to determine what kinds of discourses were made about children after the natural disaster and their sensitivities towards them after the Maraş Earthquake on Twitter since children were among the most affected by the earthquake disaster. Within the scope of the study, answers were sought to the following questions:

1. What are the hashtags mentioned in the tweets about the child after the Maraş earthquake, what did people draw attention to the most, and how are the likes and retweets of these tweets?
2. What is the emotional intensity of the tweets about the child, and how is the distribution of positive and negative tweets?

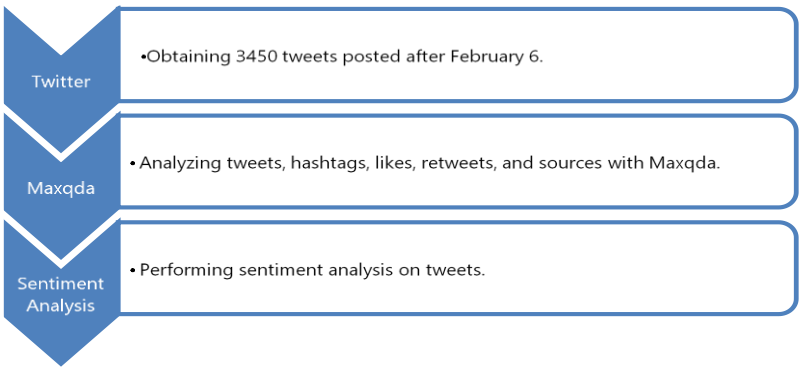
2. Method

The researchers included tweets sent from Twitter, one of the microblogging platforms, in February 2023, especially after the February 6 earthquake, in the analysis. The tweets posted in February, that is, immediately after the earthquake and containing the words "earthquake" and "child," were included in the study.

The tweets sent in the period from February 6 to the end of February were taken. 3.450 tweets were taken from the platform, and these tweets were analyzed with Maxqda software. Later, sentiment analysis was performed. The method followed in the study is given in Figure 1.

Figure 1

The Method Followed in the Study



In the study, the tweets were categorized according to the hashtags in the tweets, and the frequencies are given in Table 1. 1.710 tweets were analyzed according to hashtags because not all tweets contained hashtags. Since there were hashtags in only 1.710 tweets, the tweets could be classified.

Table 1

Hashtags in Tweets

	Frequency	Percentages
deprem [earthquake]	839	49,06
çocuk [child]	234	13,68
hatay [hatay]	139	8,13
afad [afad]	49	2,87
depremzede [earthquakevictims]	43	2,51
depremçocuklarıgüvendedeğil [earthquakechildrenarenotsafe]	35	2,05
eğitim [education]	35	2,05
gaziantep [gaziantep]	26	1,52
adıyaman [adıyaman]	26	1,52
psikoloji [psychology]	25	1,46
yardım [help]	23	1,35
kahramanmaraş [kahramanmaraş]	23	1,35
malatya [malatya]	22	1,29
kayıp [lost]	22	1,29
enkaz [debris]	21	1,23
aile [family]	14	0,82
oyuncak [toy]	13	0,76
Cocuklarıntakipcisiyiz [wefollowthechildren]	13	0,76
adiyaman [adiyaman]	12	0,70
unutmayacağız [wewillnotforget]	11	0,64
çocukyardım [childhelp]	10	0,58
travma [trauma]	9	0,53
destek [support]	9	0,53
sevgi [love]	9	0,53
depremcocuklarıguevendemi [areearthquakechildrensafe]	7	0,41
çadır [tent]	7	0,41
refakatsizcocuklar [unaccompaniedchildren]	6	0,35
cocuklarasahipcikilsin [takecareofthechildren]	5	0,29
bebek [infant]	5	0,29
Ailevesosyalhizmetlerbakanlığı [ministryoffamilyandsocialservices]	4	0,23
çocuklaroynasın [letthechildrenplay]	4	0,23
yetim [orphan]	4	0,23
oyun [play]	3	0,18
gelecek [future]	3	0,18
TOTAL	1710	100,00

Note. Hashtags are in Turkish, and their English equivalents are in square brackets.

The findings highlighted that the words *AFAD*, *education*, and *psychology* were frequently used as hashtags in tweets about the child. However, the number of tweets with the hashtag child is 235. The words lost and *toy* were also frequently used as hashtags. The findings further indicated that earthquake provinces such as Hatay, Kahramanmaraş, and Adıyaman were frequently used as hashtags in tweets.

In addition, tweets containing both child and earthquake hashtags were also analyzed, and the hashtag distributions in these tweets are given in Table 2.

Table 2

Hashtag Distribution of Tweets Containing Both Child and Earthquake Hashtags

	Frequency	Percentages
Psychology	21	36.20
Education	13	22.41
Toy	11	18.96
Family	9	15.51
Unity	4	6.80

Examples of tweets containing AFAD, education, and psychology were given and added to the study as Table 3.

Table 3

Examples of Tweets Containing AFAD, Education and Psychology

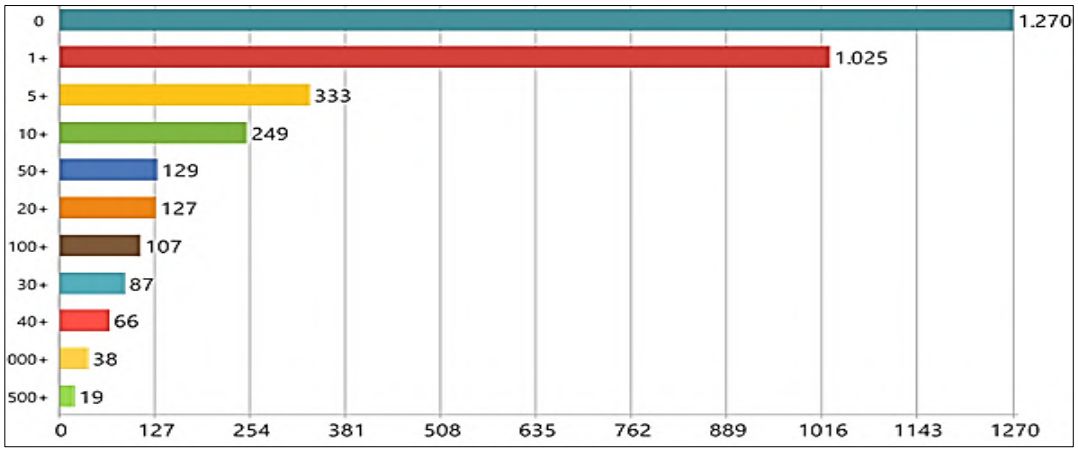
word	Tweet	
AFAD	"Halk Sağlığı Uzmanları, Hatay raporu: - İlk 48 saat arama, kurtarma yapılamadı -AFAD gecikti -Enkazdan çıkıp hastaneye yetişemediği için ölenler -Deprem öngörüldü, ölmem alınmadı - Hastanede 545 sahipsiz çocuk - Çadır, tuvalet yetersiz - Uyuz bulgusu" ["Public Health Experts, Hatay report: - No search and rescue for the first 48 hours -AFAD delayed -Dead because they came out of the rubble and could not reach the hospital -Earthquake was predicted, not my death - 545 unattended children in hospital - Tent, toilet inadequate - Signs of scabies."]	"Deprem bölgesinde acilen: - Çadır, tuvalet, mobil duş kabini, ısınmak için odun, temel gıda, çocuk maması, çocuk bezi, kuru gıda, ped, su ve Afad, Abab, Kızılay gibi kurumların önerileri ile koordineli çalışma gerekiyor." ["Urgently in the earthquake zone: -Tents, toilets, mobile shower cabins, firewood for heating, basic food, baby food, diapers, dry food, pads, water and coordinated work with the suggestions of organisations such as Afad, Abab, Red Crescent".]
education	"Sevgili okul yöneticileri; Deprem bölgesinden gelip sınıflarınızda eğitim almak zorunda kalan çocuk sayısı çok fazla. Bu durumda size çok büyük görevler düşüyor. Lütfen bu konuda gereken duyarlılığı gösterin ve hiçbir çocuğumuza kendini sahipsiz hissettirmeyin." ["Dear school administrators; there are many children from the earthquake zone who have to receive education in your classrooms. In this situation, you have a great duty. Please show the necessary sensitivity in this matter and do not make any of our children feel uncared for."]	"Ayrıca koruyucu aile olmadan da bir çocuğa sahip çıkabilirsiniz onun eğitim masraflarını karşılayarak bu deprem zede çocuk olmasıda gerekmez diğer çocuklarında sevgiye ihtiyaçları var." ["You can also adopt a child without being a foster family by covering his/her education expenses, this earthquake victim does not have to be a child, other children also need love."]
psychology	"Profesyonel psikolojik destek verebilecek uzmanların bölgeye gitmesinin engellenmesi geliyor, öfkeleniyorum. Dahası da var tabi; yök'ün çağrısı, deprem bölgesi çocuk kuran kursu vb. saymakla bitmez... Çok geçmiş olsun." ["I get angry when experts who can provide professional psychological support are prevented from travelling to the region. There is more, of course; the call of YÖK, children's Quran courses in the earthquake zone, etc... Get well soon."]	"Olası bir depremde biz özel çocuk ebeveynlerin işi daha zor. En kötü senaryoyu düşünüyorum, partinin ilçe teşkilatından yardım isterim sanırım. Zaten bozuk olan psikolojimiz bu deprem felaketiyle daha da bozuldu." ["In the event of an earthquake, we parents of special children have a harder job. I am thinking of the worst case scenario, I think I would ask for help from the district organisation of the party. Our already disturbed psychology has deteriorated even more with this earthquake disaster."]

Note. Tweets are in Turkish, and their English equivalents are in square brackets.

The analysis of the tweets about the earthquake and the child in terms of likes is given in Figure 2, and the number of likes the tweets received is also included in the figure. It is aimed at determining how much interaction the tweets received and whether they were supported by other people in the analysis.

Figure 2

Number of Likes of Tweets

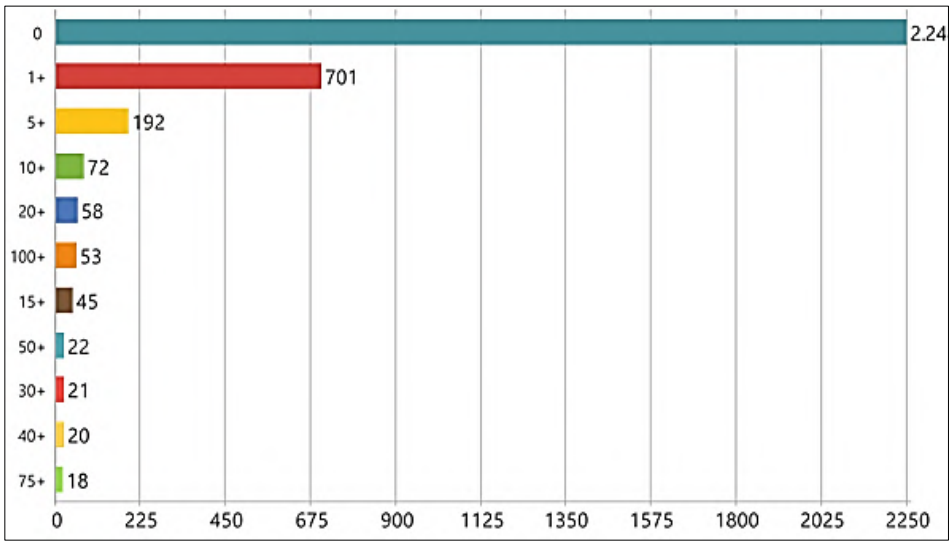


The findings indicated that the tweets received very few likes. Approximately 62% of tweets received either no likes or few likes. It is noteworthy that the number of tweets with 500 or more likes was 19.

The analysis of the tweets about the earthquake and the child in terms of retweets is given in Figure 3. As in the analysis of likes, this analysis aimed to determine how much the tweets were supported and the desire to announce to the people.

Figure 3

Number of Retweets of Tweets

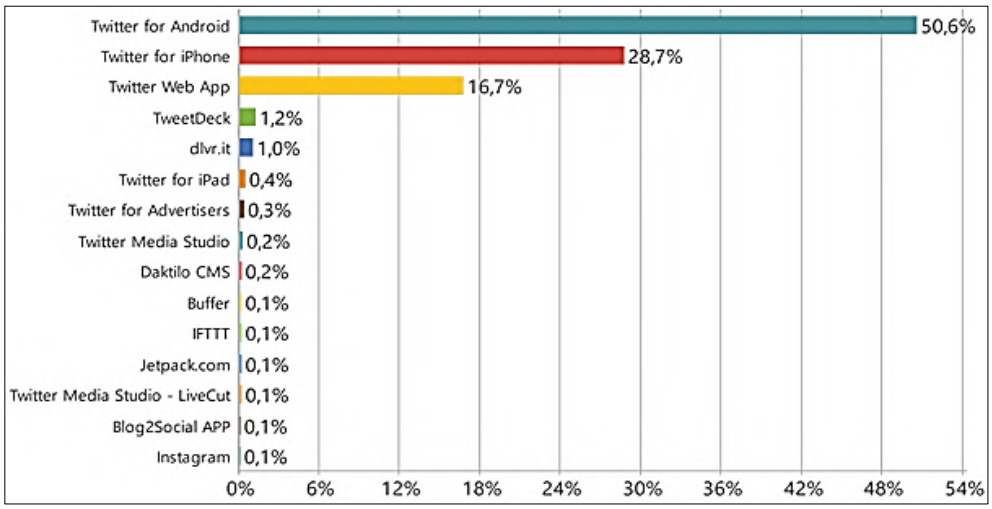


As in the number of likes, there were very low rates of retweeting. Approximately 83% had either never been retweeted or retweeted several times. It is noteworthy that the number of tweets retweeted 75 or more times was 18.

The analysis of the tweets about the earthquake and the child in terms of their source is given in Figure 4. This analysis aimed to determine what kind of devices people used to announce and receive information and to ensure that this situation should be considered in the technologies to be developed.

Figure 4

Analysis of Tweet Sources



The findings indicated that the tweets were tweeted mostly with Android devices. Almost half of all tweets were sent from Android devices. The iPhone and web apps were also frequently used.

Sentiment analysis of the tweets was also carried out. Thus, the study aimed to analyze people's emotional intensities in the context of earthquake and child. Since sentiment analysis of tweets could not be carried out with the Maxqda program, the data were exported from the program and analyzed with a program written in Python. To perform sentiment analysis on Turkish data, the BERTurk model was carried out using a model with a parameter adaptation of the 128k uncased model (Köksal & Özgür, 2021). Each tweet was given to the model, and the sentiment class and the probability of belonging to this class were calculated. The Pandas Dataframe, which was formed as a result of the analysis made with the Python language, is given in Figure 5.

Figure 5

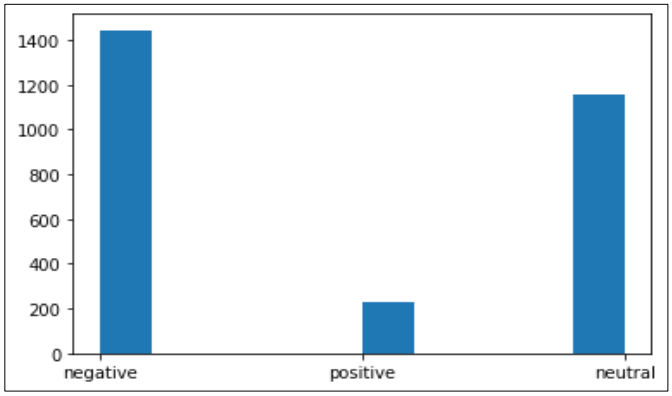
Dataframe Structure of Sentiment Analysis

	tweet	sent	skor
0	alibabacan rterdogan siyaseti bırak deprem bo...	negative	0.978446
1	kapıyı acan sihirli anahtardır tebessum olabi...	positive	0.873621
2	evimizin hali deprem hasar gordu komsuların v...	negative	0.967332
3	depremin acılı anında kusunu olsun bırakmayan...	positive	0.739386
4	yilinda yapilan calismada deprem sonrasi duyg...	neutral	0.590871

The sentiment classes and their probability values are given in Figure 6 using the Matplotlib library.

Figure 6

Sentiment Analysis Results



In addition, examples of tweets that were evaluated as positive and negative within the scope of sentiment analysis are given in Table 4.

Tablo 4

Examples of Positive and Negative Tweets

Positive	Negative
"hüngür hüngür ağlattın besiktas baba senin yerine ağlıyorum kere gurur duydum kartalım çocuklar gülsün gülsün başkadır benim memleketim turkiyem tekyurek memleketim." ["You made me cry, besiktas, dad, I'm crying for you, I'm proud of my eagle, let the children laugh, it's different, my hometown Türkiye, my hometown with one heart."]	"feryadı duymuyor musunuz ileri seviye kanser hastası kadar çocuk annemi istiyorum hüngür hüngür ağlıyor kadar vicdanınızı yitirdiniz kadar insanlıktan uzaklaştınız deprem lazım vicdanınızın sesi duyması için." ["Don't you hear the cries of children like advanced cancer patients I want my mother, you have lost your conscience, you have distanced yourself from humanity. You need an earthquake to hear the voice of your conscience."]
"enkaz altında kalan çocuğun sesinde iste kurtuldu sevindik bizim için umut oldu unutmayalım desteğimiz yana olsun." ["In the voice of the child who stood under the debris, she was saved, we are happy, there is hope for us, let's not forget that our support is on their side."]	"depremin gününden beri iktidarı muhalefeti medyası sivil toplumu tarikatı unlusu adamı varsa çocukları kullanıyor yapıyor istismar ediyor yazıklar olsun biliyorduk kadar çocuk hakkını savunuyoruz çıkar elde edeni arada gördük." ["Since the day of the earthquake, the government, opposition, media, civil society, cult, celebrity, businessman are using and exploiting children, shame on us, we defend the rights of children as much as we can, we saw the ones who took advantage of it."]
"Maşallah sana henüz şuncacık yasında hayatın yüzüyle karşılaştın umarım yolun acık bahtın güzel olur çocuk." [Mashallah, you met the face of life at this age, I hope your road is clear, your luck will be good, child."]	"yağma olayları yasandı çocuk defnettik yaslı defnettik sokağa dahi çıkılmaya korkulan donemden bahsediyorum basında asla görmediğiniz olaylardan bahsediyorum deprem günü kendim dahi bunu düşündüm." ["Looting events took place, we buried children, we buried the elderly, I am talking about the period when people were afraid to even go out on the street, I am talking about events that you have never seen in the press, even I thought about it myself on the day of the earthquake."]

Note. Tweets are in Turkish, and their English equivalents are in square brackets.

3. Discussion and Conclusion

The results indicated that while 234 tweets include child hashtag, there were very few tweets about children's safety with the hashtags of depremçocuklarıgüvendedeğil [earthquakechildren arenotsafe, refakatsizcocuklar [unaccompaniedchildren], cocuklarasahipccikilsin [takecareofthechildren], çocukyardım [childhelp]. In addition, the results highlighted that tweets about the trauma experienced by children did not appear on social platforms enough to draw attention to children who had lost their parents. However, Kousky (2016) determined that natural disasters affected children in many ways, such as getting sick due to problems such as malnutrition, psychological disorders due to various negligence, traumas, and interruption of educational opportunities. In early childhood, Bronfenbrenner (1979) emphasizes that the child's immediate environment has an impact on development and learning. Children are vulnerable to many situations such as physical, psychological and educational problems during and after natural disasters (Kousky, 2016; Peek, 2008). Children exhibit increased levels of post-traumatic stress disorder when they feel threatened by collapsed buildings, death or their own lives during or after natural disasters (Celebi-Oncü & Metindogan Wise, 2010). Deering (2000) found that the death rate and disability risk of children under the age of five was generally very high in an earthquake disaster. In addition, studies have shown that earthquake disaster causes problems in children's social skills (Gomez & Yoshikawa, 2017), children's anxiety levels to be high (Berkem & Bildik, 2001; Ceyhan & Ceyhan, 2006), and occurrence of developmental problems occur in children (Yule, 2001). Another result of the research determined that psychology, love and game tweets were tweeted to support the traumas experienced by children and to normalize the children. The results, however, concluded that the rate of liking and retweeting of these tweets was also very low. With the awareness that children will be affected the most in natural disasters, the fact that the number of discourses that will contribute to the normalization process of children such as drawing attention to the trauma situations of children on social media platforms, the first interventions, various therapies such as games was very few could be due to the fact that people did not adequately understand the importance of early childhood. Similarly, instead of rehabilitating children's traumas after the earthquake using media elements, Karataş (2022), and Usta and Yükseler (2021) stated that children's rights were ignored and ethical violations were made against children in the media, and that this situation would affect children's future lives was ignored.

Another research result highlighted that most tweets were sent from Android devices, but iPhone and web applications were also frequently used. Kaigo (2012) found that basic phones could not be used for voice calls during the earthquake, but tweets could be sent thanks to the internet-based applications of smartphones, so the use of smart devices became the primary priority. The report shared by StockApps indicated that the usage rate of Android mobile phones in Türkiye was approximately 70% (StockApps, 2022). The tweet sources posted are consistent with this ratio. This situation can be considered in the software and technologies planned for earthquakes and children.

The results of the sentiment analysis determined that negative reactions were in the majority. Negative reactions included reactions to children who lost their parents, to the abuse of children, and to people who loot without caring about the loss of many children's lives. Positive tweets included many wishes for a better future for the children. Oh et al. (2010) found that information on how to adopt orphans was tweeted after the Haiti earthquake. People must be more careful about social media posts, especially about children, after disasters. Sharing positive comments about the child, such as how they can be adopted and how they can be protected, can be helpful. This can be integrated into earthquake and disaster education.

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The authors declare that this article complies with ethical standards and rules.

AUTHOR CONTRIBUTION
Mesut Polatgil | Concept/idea; Drafting; Data collection/analysis; Supervising; Critical review; Final approval and accountability. Contribution rate: 50%

Ensar Yıldız | Literature review; Design; Drafting; Interpretation of data/findings; Critical review; Final approval and accountability. Contribution rate: 50%

CONFLICT OF INTEREST
The authors declare no conflict of interest.

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