Impact of February 6, 2024 Earthquakes on Community Resilience

6 Şubat 2024 Depremlerinin Toplumsal Dirençliliğe Etkisi

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ÖZ

Bu çalışma, coğrafyanın en önemli unsurları olan insan ve mekânın etkileşimini toplumsal dirençlilik bağlamında araştırmaktadır. Toplumsal dirençlilik bir toplumun afetlerin etkisinde en kısa sürede kurtularak değişen koşullara uyum saplama sürecidir. Artan afet riskleri bağlamında toplumların dirençliliğini artırmaya yönelik ilgiler hem akademik hem de politik çevrelerde her geçen gün artmaktadır. Dirençli bir toplum afetle mücadelede en önemli bileşenlerden biri olarak değerlendirilmektedir. Bu çalışma, 6 Şubat 2023 depremlerinden sonra bireylerin görüşlerinden yola çıkarak dirençlilik algılarını belirlemeyi amaçlamaktadır. Bu görüşmeler, nitel araştırma türünde gerçekleştirilmiştir. Araştırmada, tipik durum örneklemesi kullanılmıştır. Katılımcılar her iki depremi de yaşamış (24 Ocak Elazığ ve 6 Şubat 2023 Kahramanmaraş) bireylerden seçilmiş ve eşit cinsiyet dağılımı aranmıştır. Görüşmeler ikinci depremden altı ay sonra, 15 Temmuz-15 Ağustos 2023 tarihlerinde gerçekleştirilmiştir. Depremden etkilenen üç il olan Elazığ, Kahramanmaraş ve Malatya'dan 11 kadın ve 11 erkek depremzededen oluşan 22 kişi ile yüz yüze yarı yapılandırılmış görüşme gerçekleştirilmiştir. Görüşmeler sonrasında elde edilen görüşlerin betimsel analizi yapılmıştır. Benzer cevaplar bir araya getirilerek toplumsal dirençliliğe yönelik çıkarımlar sosyal, çevre, ekonomik çevre, yapılı çevre, doğal çevre ve kurumsal çevre boyutları açısından değerlendirilmiştir.

Anahtar Kelimeler: Afet, Dirençlilik, Toplumsal Dirençlilik, Kentsel Dirençlilik, Deprem Dirençliliği

ABSTRACT

This study explores the interaction of people and place, the most important elements of geography, in the context of community resilience. Community resilience is the process of adaptation of a society to changing conditions by recovering from the effects of disasters as soon as possible. A resilient community is considered one of the most important components of disaster respons. In the context of increasing disaster risks, interest in increasing community resilience is growing in both academic and policy circles. This study seeks to understand how individuals affected by the February 6, 2023, earthquakes perceive resilience. These interviews were conducted as qualitative research. Typical case sampling was used in the study. Participants were selected from individuals who had experienced both earthquakes (January 24, Elazig and February 6, 2023, Kahramanmaraş) and equal gender distribution was sought. Interviews were conducted on July 15 and August 15, 2023, six months after the second earthquake. Interviews were conducted with 22 people, consisting of 11 female and 11 male earthquake survivors from Elazig, Kahramanmaraş, and Malatya, the three provinces affected by the earthquake. A descriptive analysis of the opinions obtained after the interviews was conducted. Similar answers were brought together, and conclusions on social resilience were evaluated in terms of social, environmental, economic, built, natura, and institutional environment dimensions.

Keywords: Disaster, Resilience, Community Resilience, Urban Resilience, Earthquake Resilience

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1. Introduction

In the 21st century, the increasing number of disasters has negatively affected the community structure. Disasters particularly target developing communities. This situation causes greater destruction in countries with high earthquake risk and negatively affects community resilience.

What were the reasons a community survived and recovered quickly after a major disaster? (Sherrieb et al. 2010). This question depends on how communities view resilience work. There is a parallel between the resilience of society and its economic development. In fact, it is important to understand the coping capacity of communities in the face of acute shocks (floods, earthquakes, terrorist attacks, etc.) and chronic stresses (climate change, poverty, etc.).

The concept of resilience was first used to describe the ways in which ecological systems overcome challenges (Holling 1973). But when the concept is applied to people and their environment, it is basically a metaphor (Norris et al. 2008). Resilience can be defined as the capacity of a system to cope with unexpected events, sudden changes and prevent their negative effects (Büyüközkan et al. 2022).

In general, resilience can be defined as "the capacity of urban populations and systems to withstand a wide range of shocks and disruptive challenges" (Coaffee, 2013; Romero-Lankao & Gnatz, 2013). At the same time, the concept of resilience has different definitions according to the areas where it is used (Büyüközkan et al., 2022). The concept of resilience is used in various areas such as socio-ecological (Cinner & Barnes, 2019; Folke, 2006; Li et al., 2020; Walker et al., 2004); natural disasters and risk management (Baker, 2009; Cutter et al., 2008; Kusumastuti et al., 2014; Ride & Di Bretherton, 2011); adaptation to climate change (Engle et al., 2014; Parker & Penning-Rowsell, 2022); international development (Katrina Brown & Elizabeth Westaway, 2011; Patriarca et al., 2018; Perrings, 2006); engineering systems (Woods, 2015; Yodo & Wang, 2016); sustainability of energy systems (McLellan et al., 2012) and planning (Becker, 2023; Béné et al., 2018; Bush & Doyon, 2019; Masnavi et al., 2019; Sharifi & Yamagata, 2018) are used in many areas including (Meerow et al., 2016).

Community resilience is basically a concept used to assess similar elements to resilience. However, what is meant by community here is further complicated by the fact that what is meant by community varies. A community is the sum of people living together in a geographical area with defined borders (Norris et al. 2008). This community unit is a settlement, such as a village, town, city, or even a country. Each geographical unit interacts with each other through social, economic, and cultural relationships. For example, after a disaster such as an earthquake that occurs in different geographies and negatively affects social resilience, communities have different capacities to overcome and cope with challenges. This is why each community has different levels of resilience. Therefore, the capacity to adapt after a disaster and to use available resources effectively and efficiently to overcome challenges and even to recover better than before determines the capacity for societal resilience (Rapaport et al. 2018).

The focus of this study is to measure the post-earthquake resilience perceptions of communities living within specific geographical boundaries. However, assessing community resilience is an extremely complex process. In particular, the dynamic interaction of communities and space makes the process even more complex (Mayunga 2007). Especially the different scales of the area affected by disasters cause differences in the evaluation of resilience (Rapaport et al. 2018). However, according to Patel et al. (2017), there are nine main aspects of community resilience in the face of disasters: local knowledge, community networks and relationships, communication, health, governance and leadership, resources, economic investment, preparedness and mental outlook. In fact, these individual perceptions are important data sources for decision-makers in increasing and managing social resilience. In this context, the study recommends using the resilience perceptions of those living in a certain geographical area as a framework for assessing the community's disaster resilience. They

have a critical role in the success of prevention before and reconstruction after a disaster. Most of the existing assessment tools are based on institutional data sets and they generate resilience analyses based on generic data sets. However, the perceptions of individuals who have experienced an earthquake may differ according to the society they live in, the type of disaster, their level of economic status and their education levels. Survivors' self-perceptions of resilience continue to be an important area of research in disaster research (Doğulu et al., 2016). Building on this gap, we assessed community resilience from the perspective of earthquake survivors. We evaluated these individuals' views on resilience in terms of socio-economic, institutional, and environmental dimensions.

There are many studies conducted in Türkiye within the scope of creating a disaster-resilient community. Various institutions and organizations are pioneering in the researches carried out to increase the resilience of society and the system against disasters. In research carried out within this scope, it is aimed to be prepared for disasters and emergencies through risk-reducing measures at the individual, family and institutional level, to strengthen response capacity, and to improve knowledge and skills through training and drills (Gerdan, & Özdemir 2017). Some of the activities carried out to increase the resilience of society and the system against disasters are as follows (Varol & Kırıkkaya 2017):

- *"Disaster Sensitive Settlement Türkiye Facility Maps Project (TADYUS)*
- *Capacity Building for Effective Disaster Risk Management Project in cooperation with JICA and AFAD*
- *Türkiye Disaster Information Bank Project.*
- *Integrated Disaster Risk Mapping Project.*
- *Türkiye Disaster Response Plan (TAMP).*
- *National Critical Infrastructure, Assets, and Facility Identification Project.*
- *Earthquake Early Damage Estimation Project.*
- *North Anatolian Fault (GONAF) Geological Observations Project.*
- *Disaster Regulation Updating Project.*
- *Disaster Ready Türkiye Project.*
- *Türkiye Disaster Management Strategy Document.*
- *DASK is compulsory disaster insurance.*
- *Reconstruction of Areas under the Disaster Risks Project.*
- *Integrated Warning and Alarm System (IKAS) Project.*
- *Türkiye Disaster Risk Reduction Plan (TARAP).*
- *Disaster Response Plan (TAMP).*
- *Türkiye Disaster Management Strategy Document (TAYSB).*
- *AFAD Volunteering Project.*
- *Disaster Risk Reduction System (DRRS)" (Varol & Kırıkkaya 2017)*

2. Methods

The study examines how individuals affected by earthquakes perceive community resilience through qualitative research methods. Qualitative research aims to answer the "how," "why," and "what" questions of a phenomenon (L Haven & van Grootel, 2019; Thorogood, Nicki, Green, Judith, 2018). The study uses a case study approach and a phenomenological design, which involves the researcher describing the lived experiences of individuals about a particular phenomenon as reported by participants. The goal of this type of research is to identify the essence of the experiences shared by individuals who have all encountered the same phenomenon (Creswell, 2009). The case study is the February 6, 2023, Elazig, Malatya, and Kahramanmaraş earthquakes. One-on-one semi-structured

interviews were conducted with a representative sample of people who experienced the earthquakes six months after the event to achieve the research goals.

2.1.The case study context: Türkiye and the 2023 earthquakes

Türkiye is situated on several major fault lines (Caglar et al., 2023). On February 6th, 2023, Türkiye was struck by two devastating earthquakes with magnitudes of 7.7 and 7.5 on the EAF, triggering liquefaction, landslides, rockfalls, and rock avalanches (Gokceoglu, 2023). The earthquakes resulted in more than 50,000 reported Fatalities, according to official figures from the Turkish Statistical Institute (TUIK) and extensive damage in southeastern Türkiye. Eleven provinces with a total population of 14,013,196 people making up 16.4% of Türkiye's total population were affected (Figure 1, Table 1). These devastating earthquakes caused an estimated economic loss of 103.6 US$ (TC Presidential Stratejiet al. and Budget Presidency, 2023).
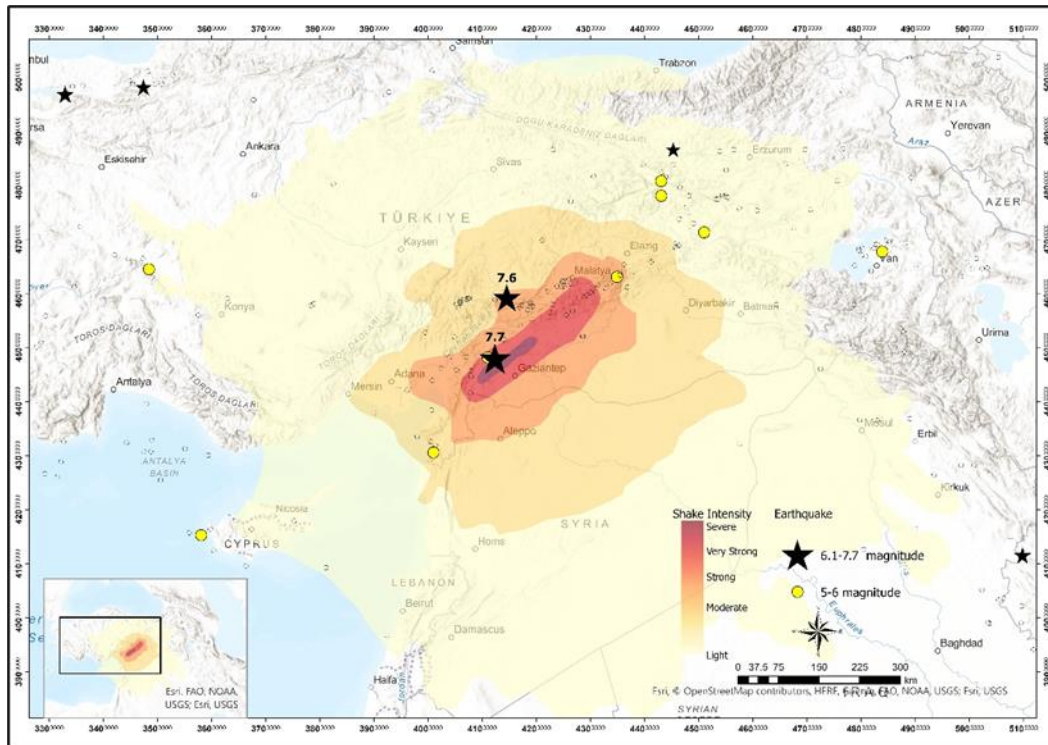

Figure 1. Earthquake-affected areas. Sources: US Geological Survey, LandScan-Graphic: Henrik Pettersson, CNN. AFAD, Instrumental Period Earthquake Catalog.

Table 1 Demographic Structure of Earthquake Affected Provinces (2022, ABPRS)

Province	0-14	15-64	65+	Total
Adana	539247	1523411	211448	2274106
Adiyaman	177617	404271	53281	635169
Diyarbakir	571682	1140208	92990	1804880
Elazig	125472	401774	64251	591497
Gaziantep	663463	1366161	124427	2154051
Hatay	445780	1102478	137785	1686043
Malatya	176728	545210	90642	812580
Kahramanmaraş	307981	764905	104550	1177436
Şanliurfa	833891	1246531	89688	2170110
Kilis	40881	95119	11919	147919
Osmaniye	140510	366904	51991	559405
Regional population	4023252	8956972	1032972	14013196
Male	2061060	4524779	463380	7049219

Female	1962192	4432193	569592	6963977
National population	18735112	58092772	8451669	85279553
Male	9612723	29341141	3750248	42704112
Female	9122389	28751631	4701421	42575441

Source: TC Presidential Strategic et al. and Budget Presidency, 2023

The earthquake-affected region has 3,029,422 households, with an average household size of 3.5 people. Which is higher than the national average of 3.2 people. Of the approximately 2.5 million buildings in the region, 90% are residential, 3% are public, and 6% are workplaces. Over 14% of the total housing stock of 5,649,317 units, is located in Türkiye (794,374 units) are in the 11 affected provinces (TC Presidential strategy et al. and Budget Presidency, 2023). The homeownership rate in the affected region is 62.3%, higher than the national average of 60.7% (TC Presidential Stratejiet al. and Budget Presidency, 2023). Around 300,000 buildings suffered severe damage (Gokceoglu, 2023), displacing over one million people.

2.2. Participants

Participants were selected from people who experienced the Elazığ-Sivrice earthquake on January 24, 2020 and the Kahramanmaraş earthquake on February 6, 2023. Unlike quantitative research, which emphasizes statistical generalization, is of utmost importance, qualitative research uses purposive sampling and allows in-depth analysis (Miles et al., 2014; Yıldırım Döner & Demir, 2022). In this research typical case sampling, a type of purposeful sampling, was used. Participants were selected from individuals who have experienced both earthquakes and an equal gender distribution was sought. The interviews were conducted six months after the second earthquake, August 19-30, 2023 . 22 face-to-face semi-structured interviews comprising 11 female and 11 male earthquake survivors from the three affected provinces of Elazig, Kahramanmaraş, and Malatya were conducted (Table 2). The data collection process was concluded after the answers from the participants started to repeat as the explanatory power of information is more important than sample size in this type of research (Yıldırım Döner & Demir, 2022).

Table 2 Social and economic variables that define the participants.

ID Number	Age	Gender	Marital Status	Education	Occupation	Property Damage
P1	34	Female	Single	Master's degree	Government employee	Undamaged
P2	38	Male	Married	Bachelor's degree	Employer	Undamaged
P3	37	Male	Married	Associate degree	Government employee	Heavily damaged
P4	37	Male	Single	PhD	Unemployed	Heavily damaged
P5	27	Male	Single	Bachelor's degree	Unemployed	Slightly damaged
P6	34	Male	Married	High school	Worker	Heavily damaged
P7	72	Male	Married	High school	Retiree	Heavily damaged
P8	53	Male	Married	Secondary school	Retiree	Heavily damaged
P9	75	Female	Married	Illiterate	Housewife	Heavily damaged
P10	43	Female	Married	Primary school	Housewife	Ruined
P11	47	Male	Married	Primary school	Worker	Heavily damaged
P12	49	Female	Married	Primary school	Housewife	Heavily damaged
P13	33	Male	Single	High school	Unemployed	Ruined
P14	30	Female	Married	Secondary school	Housewife	Heavily damaged
P15	58	Female	Married	Primary school	Housewife	Moderately damaged
P16	48	Female	Married	Primary school	Housewife	Moderately damaged
P17	28	Female	Married	Primary school	Housewife	Moderately damaged
P18	60	Female	Married	Master's degree	Retiree	Ruined
P19	23	Male	Single	Associate degree	Unemployed	Moderately damaged
P20	27	Female	Single	University	Unemployed	Heavily damaged
P21	25	Female	Single	University	Unemployed	Heavily damaged
P22	21	Male	Single	High School	Unemployed	Heavily damaged

2.3. Data Collection

Data was collected through face-to-face interviews between July 15 and August 15, 2023, six months after the February 6, 2023, Kahramanmaraş earthquake. The short period of time from the disaster to data collection is significant here to ensure that participants' recollection of the events and their feelings are fresh in their minds, and they are still experiencing the ongoing impacts. During the interview, participants were asked nine open-ended questions about their experiences of the January 24, 2024, Elazig and February 6, 2023, earthquakes, the impact of the earthquakes on their lives, and their perceptions of community resilience. These questions are based on a holistic approach to recovery environments. Community development approaches that engage and a mobilize community strengths and capacity are most effective in ensuring that recovery activities will be locally relevant, accessible, and meet the needs of affected communities (AIDR, 2022). In this context, the following questions were asked to determine the participants' perceptions of community resilience in social, environmental, economic, building, and institutional environments.
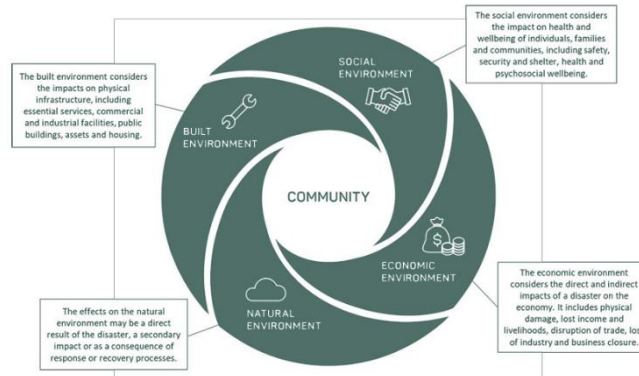
Figure 2. Recovery environments: a holistic approach (AIDR, 2022)

1. "*How did the earthquakes affect you?*
2. *What measures have you taken to adjust to the alterations brought about by the earthquakes?*
3. *How did you overcome the economic and social difficulties caused by the earthquakes?*
4. *What steps can be taken before an earthquake to reduce structural damage?*
5. *How can we deal with the adverse impacts of earthquakes and what precautions can be taken to minimize damage caused by them?*
6. *Who supported you in overcoming the earthquake's negative effects and how did they help?*
7. *Developed societies are better equipped to handle earthquakes. Was our society adequately prepared for and aware of the recent seismic events?*
8. *What measures should be taken to develop cities that can withstand earthquakes and ensure their resilience?*
9. *How do resilient communities and cities address the challenges that arise after an earthquake?"*(Doğulu et al., 2016).

Among the questions asked above are those aimed at determining Social Resilience (1-2-7-9), Economic Resilience (3-7-9), Infrastructure Resilience (4-7-9), Planning and Settlement Pattern Resilience (7-8-9), and Institutional Resilience (5-6-9). However, the answers to these questions are different from each other. The responses of the respondents are analyzed in detail in the findings section.

Before the interview, the aim of the study was explained to all participants and voluntary participants were interviewed. All interviews were audio recorded and transcribed by the researcher. In this study, no identifying information about the participants was collected and the study was conducted in accordance with ethical rules. The necessary ethics committee decision document numbered 17264 was obtained from Fırat University.

Measures and Data Analyses

The voice recordings obtained at the end of the fieldwork were transcribed for analysis. The transcribed data were classified using participant codes. Then, these data were coded using MAXQDA software for descriptive content analysis. Descriptive content analysis evaluates trends and research findings on a specific subject in a descriptive dimension (Sozbilir et al., 2012). The study aimed to ensure category clarity by creating categories that reflect the sub-dimensions of resilience of infrastructure, ecological, social, economic, and institutional. During analysis, similar answers were collated and their frequencies tabulated.

3. Results

In this section, the findings obtained from the interviews are analyzed and explained based on the literature. In this context, social resilience is evaluated under social, economic, infrastructure, planning and settlement fabric and institutional sub-themes

3.1. Dimensions of Community Resilience

3.1.1. Social Resilience

The social resilience concept is the capacity of a society to help each other after disasters, to be together and to cope with the negativities caused by disasters. Under the theme of social resilience, the responses of the participants were analyzed to understand their safety, shelter, health and psychological levels after the earthquake. Moreover, 57% of the participants stated that they could not overcome the negative effects of the earthquake even 6 months after the earthquake.

The Effect of the Earthquake on the Participants
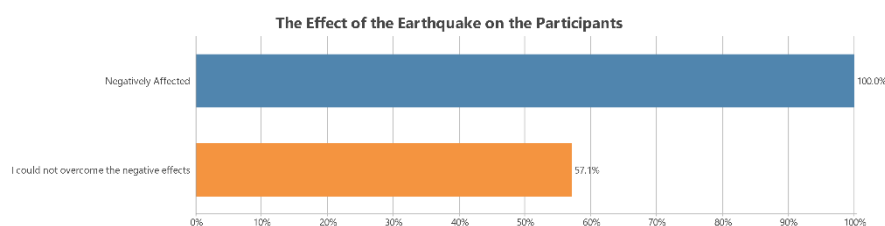
Figure 3. The Effect of the Earthquake on the Participants

Upon analyzing Table 3, it is evident that participants predominantly perceived the negative effects of the earthquake as psychological and economic. The interviewed participants coded that the socially negative effects of the earthquake were lower in relation to the aid provided. On the other hand, the rate of those who have not overcome the adverse effects six months after the earthquake is relatively high. Participant 7 made the following comment about factors that weaken resilience

> "The earthquakes have affected us a lot, it is very painful for us after this age. ... We were affected negatively, both socially and psychologically. We tried to adapt ourselves as much as we could; there is nothing else we can do. In this process, we received help from friends and relatives. We tried to support each other. I did not receive psychological support".

Participant 16, who renewed this situation, emphasized his life changing with the earthquake and said the following:

> "Before the earthquake, we had a workplace and a house to stay in. We lost everything with the earthquake. We were negatively affected both economically and socially. But in the meantime, we could not overcome the changes caused by the earthquake".

Table 3. The Effect of the Earthquake on the Participants

Categories	Frequency f
I could not overcome the negative effects	15
Social	14
Psychological	23
Coded Documents	22

Assistance and service gaps after earthquakes present challenges to community resilience. The difficulties surrounding post-earthquake adaptation are primarily attributable to the shortcomings in aid and services. Insufficient precautions before the earthquake, inadequate services, chaos following disasters, lack of societal awareness about disasters, and issues with gathering areas and temporary shelters after disasters are all highlighted (Table 4).

Table 4. Hindering factors for social resilience

Categories	Frequency f
Aid and service Issues	38
Insufficient Precaution	14
Insufficient services	9
Lack of social awareness	9
Temporary accommodation problem	4
Disorganization	2

Following the earthquake, participants' need for shelter and difficulty accessing food were cited as factors that negatively impacted community resilience. In addition, factors affecting disaster resilience include the neglect of post-earthquake emergency gatherings and protected areas, as well as low levels of public awareness of the issue. Interviewees mostly emphasized the lack of preparedness for earthquakes and the inadequacy of emergency gathering areas, temporary housing and food supply in the city. Some of the interviewees argued that the main reason for this situation is that society did not take lessons from the earthquakes in the past and disaster management planning was not given the necessary importance. Participant 22 said that if the necessary lessons had been learned from past earthquakes, society would be more resilient:

> "Unfortunately, Malatya was quite unprepared for the earthquake, even though it had experienced the Elazığ earthquake before. Although the people of Malatya were aware of the earthquake, they were insufficient in terms of preventing and being prepared for the earthquake. We saw this from the shortcomings experienced during the earthquake; even the tent arrived on the 10th day of the earthquake".

After a devastating disaster such as an earthquake, meeting basic food needs, social solidarity, easy access to health services, and solving problems such as security and shelter are perceived as a processes that increase community resilience (Table 5). Some of the participants emphasized that despite the negative effects of the earthquake, they felt safer in this process thanks to solidarity and state support in the construction of permanent housing after the earthquake.

Table 5. Facilitating factors for Social Resilience

Categories	Frequency f
Providing assistance	51
Temporary accommodation	17
Basic needs	21
Solidarity	20
Community solidarity	4
Family solidarity	13
Having faith	3
Psychological support	4
Staying in safe places	4

Moving to different city	8

3.1.2. Economic Resilience

Post-earthquake economic resilience is adversely affected by structural damage to the city, including loss of income, trade, and closure of industries and businesses. During the interviews, the discussion revolved around two interconnected scales that determine the economic resilience of city: the resilience of individuals, households and sectors, and the resilience of the city as a whole. Participants consider the lack of financial resources as a factor that negatively affects resilience in the reconstruction process due to the significant structural damage to cities after the earthquake.

Participant 8 said the following in this regard:

> ... we moved to the container city to overcome the difficulties. There are no buildings in the city. Our house was destroyed. We cannot make a living if we go to another city… If there were disaster-resilience cities, their infrastructure would be sound, they would survive economically, everyone would be in solidarity with each other socially and we would overcome these problems".

Individuals and households are vulnerable due to the reconstruction of cities and current economic losses. However, state institutions, NGOs, relatives, and friends were perceived as facilitating factors in this process. Many participants emphasized that the post-earthquake assistance made them feel safer (Table 5). P 19 said that:

> "My family, friends, relatives, and neighbors provided moral support during the earthquake. Later, AFAD and NGOs were also helpful."

The significance of state institutions and social solidarity is crucial in times like these. In the event of a catastrophic earthquake that impacts a significant portion of the nation, relying solely on family support and government assistance may not be sufficient to overcome the challenges. P 22 has expressed the following thoughts regarding this matter:

> "During difficult times, both state institutions and citizens came together to overcome the challenges ahead. Our success largely depended on strong family relationships and mutual support. By working together and supporting each other, we were able to navigate through these tough times, both materially and morally"

3.1.3. Infrastructure Resilience

Ensuring the resilience of physical infrastructure systems such as basic services, public buildings, industrial facilities, and individual dwellings is of utmost importance, particularly in cities that experience significant post-earthquake devastation. In the event of an earthquake, the stability of buildings and supporting infrastructure systems are of paramount importance. Interviewees emphasized the impact on resilience of the construction technique and supervision of buildings in the built environment and the damage to physical infrastructure systems after an earthquake. The dwellings of 10% of the participants affected by the earthquake were destroyed. However, the total number of houses with severe and moderate damage is 85%. Only 10% of the respondents' houses are undamaged and inhabitable (Table 6).

Table 6 Impact of Earthquake on housing.

Housing Status	Frequency f
Heavily Damaged	14
Moderately Damaged	4
Ruined	2
Undamaged	2
Slightly damaged	1
Coded Documents	22

Due to the damage to their homes, the participants were forced to relocate. About 72,73% of them relocated to a container city and tent city. The high number of container cities, particularly in Malatya, provides temporary housing for those affected by damaged homes. Those who felt that their city was not safe moved to another city.

Table 7. Effect of earthquake on displacement

Relocation	Frequency f
Container Home	12
Different city	9
Tent City	4
Changed neighborhood	2
live in a car	1
Changed Houses	1
Foundation House	1
Same house	1
Coded Documents	22

One of the most frequently emphasized negative effects of the earthquake on the built environment is that the existing building stock had not been examined at the required level and consequently structural damage is high. Interviewees 4 and 5 shared the following insights:

> "…the structures of houses could have been determined after the Elazig earthquake to minimize damage. It is essential to examine the existing building stock in detail and demolish buildings damaged by past earthquakes that do not meet regulations, prioritizing them for urban transformation. I believe that damaged buildings should be relocated. Despite partial measures taken after the Elazig earthquake, many buildings were still damaged. Malatya did not take necessary precautions and suffered more damage than Elazig in the last earthquake"

> "If the necessary measures had taken after the Elazig earthquake, the impact of the disaster could have been reduced. The transportation infrastructure was severely affected, making it difficult to provide aid. Therefore, it is essential for each city to have its own equipment and trained personnel to prepare for such situations…"

In the interviews, there was widespread agreement that a detailed examination of the existing building stock and the resilience of risky buildings is crucial to increasing the resilience of the built environment in cities (Table 8).

Table 8. Factors Affecting Built Environment Resilience

Categories	Frequency f
Investigation of Building Stock	21
Techniques for constructing earthquake-resistant buildings.	21
Urban Transformation	17
Building Inspection	13
Changing the Building Stock	7
Floor Restriction	7
Infrastructure examined	5
Resilience building	5

3.1.4. Planning and Settlement Patterns

When asked what needs to be done to make their cities more erathquake-resilient, most of the interviewees mentioned mountainous and rocky areas away from the plain floor (Table 9). Participant

1, who was asked about his views on this issue, made the following comments about the factors that weaken resilience.

> ... because we are geographically located in a young generation region, earthquakes are a constant occurrence. We have experienced this earthquake, and we have lost a lot of lives and property, but earthquakes will continue again. Therefore, it is necessary to accept the earthquake reality and plan accordingly. Yes, we are an earthquake-prone country, but for this, we need to build strong buildings, live in areas with solid ground, quick decisions, and take the right steps in sudden situations.

Participant 5 echoed these views and suggested the following: "No matter how much urban resilience increases, dense population causes chaos, so dense population accumulated in one place seriously reduces urban resilience. Urban areas should be spread over wider areas, densely populated areas should be sparser, and the buildings should be made strong... Buildings suitable for horizontal architecture with fewer floors could be built on solid ground".

Table 9. Factors Affecting Natural Environment Resilience

Categories	Frequency *f*
Solid Ground	16
Ground Investigation	15
Suitability for Settlement Analysis	10
Plains and valleys should not be opened for settlement	8
Urban sprawl with Horizontal Structuring	8
Settlement far from fault lines	7
Risky Settlements relocated	5

3.1.5. Institutional Resilience

After a devastating disaster such as an earthquake, organizations reduce uncertainty by meeting the expectations of individuals and making decisions for the future. Plans prepared by institutions before, during and after disasters are considered elements that positively affect resilience. In the interviews, it was widely argued that the management of urban areas and spatial planning by institutions are very effective in creating a society that is more resilient to future disasters. The most emphasized concepts in the interviews are resilient planning, and disaster Preparedness, and risk reduction processes (Table 10).

Table 10. Factors Affecting Institutional Environment Resilience

Categories and/or subcategories	Frequency *f*
Resilient Planning	
Resilient Master Plans	10
Temporary gathering and shelter areas	8
New Earthquake regulations	8
Zoned Structuring	2
Reduce population density	2
Disaster Preparedness and Risk Reduction	
Informed Community	13
Disaster Education	12
Information Before, During, and After an Earthquake	10
Informed Managers	6
Disaster Risk Reduction Plans	3
Disaster management Budget	2

Many interviewees expressed the inadequacy of current practices in building a resilient community. In this regard, participant 2 argued the following:

> "For a resilient community, disaster and risk reduction plans should be prepared; all age groups should be made aware of disasters through disaster awareness trainings and what to do before, during and after earthquakes should be known... for this, earthquake training can be given in schools. Because earthquake are an inevitable reality in the environment we live in. Therefore, existing plans should be reviewed..."

Another most emphasized element of creating a resilient community is disaster and emergency awareness and it is emphasized that it is possible to gain an informed community structure. Individual disaster awareness trainings are essential for communities to be resilient. In this context, individuals who have adopted the right behaviors before, during and after disasters are very important for creating a resilient community. In the words of participant 12:

> "Education plays a crucial role in building resilient societies. We need to raise awareness about disasters. Civil society organizations and local governments need to come to the forefront. Earthquake victims need to be supported socially, economically and psychologically".

A great majority of the interviewees emphasized that disaster education starting at a young age is important in increasing social resilience. Because school-age children are the most vulnerable group, and they are also considered the first step in building a resilient community. In this regard, P 3 stated that:

> "In order to become a resilient community, earthquake education can be given in schools. Because earthquake are an inevitable reality in the environment we live in. Disaster awareness trainings are important to raise awareness of all age groups about disasters and to know what to do before, during and after an earthquake".

4. Discussion

This study aims to reveal the resilience perceptions of individuals as one of the important ways to increase community resilience. In this context, the opinions of disaster victims about how they were affected by the earthquake and the steps to be taken to build a resilient city after the February 6 Kahramanmaraş earthquakes, the disaster of the century, were evaluated. In this study, as in other studies, resilience is perceived to be a process leading to adaptation, not an outcome or stability, and the state as a central actor and local institutions were perceived as extremely important for post-earthquake resilience, and these institutions were perceived to increase resilience (Aldrich & Meyer, 2015; Doğulu et al., 2016; Kasapoğlu et al., 2004). As can be understood from the discourses of the participants, the most important way to increase post-earthquake resilience is to increase social, economic and psychological supports. These supports are possible through individual and social disaster preparedness trainings of public institutions and evaluation of existing cities from the perspective of resilience. However, the fact that the February 6 earthquakes occurred in a very wide geography was perceived as a deficiency in reaching management activities. This was emphasized as a factor that negatively affects disaster resilience. Regardless of the scale, it is crucial for states to be well-prepared to handle natural disasters (Andrews & Quintana, 2017). Nevertheless, while governments emphasize the importance of disaster preparedness in reducing loss of life, national-level disaster risk reduction measures alone are insufficient to shield households from the catastrophic effects of disasters (Hoffmann & Muttarak, 2017). Accordingly, NGOs, international organizations, and local governments are making efforts to reduce disaster risks and increase disaster awareness(Hoffmann & Muttarak, 2017; Seddiky et al., 2020). For this reason, preparation for a

national disaster and knowing what to do before, during and after a disaster is perceived as a factor that increases resilience.

In disaster-prone countries and regions, educationo on and for disasters is promoted as part of disaster mitigation/prevention/preparedness measures in usual times (Kitagawa, 2021). However, multiple studies have demonstrated that, overall, families and households are underprepared for disaster (Kohn et al., 2012). Although the Republic of Türkiye has a very old disaster management structure, its disaster management structure changed after the August 17, 1999 earthquakes (Ganapati, 2008). After the 1999 earthquake, existing disaster management plans underwent changes. The state initiated various measures to reduce loss of life and property through disaster risk reduction and awareness training (Unlu et al., 2010). Despite all the initiatives of the government, the impact of disaster and risk reduction trainings on an individual basis has been quite low and it has become necessary to develop a more widespread method to increase resilience. Because in the analyses, the participants stated that disaster training mostly is important.

In developing countries, disasters invariably affect more severely the marginalized, the poor, and the vulnerable, destroying the fragile socio-economic fabric of their communities and calling into question their capacity to sustain the slow process of reconstruction (Khan & Sayem, 2013). In thıs study post-disaster aid was emphasized as a factor that increases resilience. Provision of temporary shelters, basic food aid and socio-psychological support was perceived as elements that increase resilience after the earthquake. The government, NGOs, and individuals provided a lot of aid to the affected areas. However, the problems experienced in the distribution of halves, uncertainties in the construction process of permanent housing, and the inadequacy of temporary housing in terms of environment and living conditions have emerged as factors that negatively affect resilience.

5. Conclusion

This study presents a content analysis of disaster resilience based on the discourses of the survivors of the February 6, 2023, Kahramanmaraş earthquakes. The research shows that earthquake survivors are aware of a wide range of resilience factors, including social, economic, building, institutional, and environmental factors. It also reveals that the primary way to build a resilient society is to build resilient cities.

Our findings show that the resilience levels of existing cities are low and if this situation does not change, similar problems will continue in future disasters. Therefore, it is essential to make disaster awareness a part of the education system starting from an early age to increase community resilience. Disaster preparedness and post-disaster relief and response activities need to be contextualized in the education system. Thus, disasters will cease to be a traumatic event that is often devastating, sudden, and can cause social upheaval (Gil-Rivas & Kilmer, 2016) .

Current findings reveal the necessity of knowing the environmental conditions after a disaster such as an earthquake and adopting planning principles accordingly. Within the scope of this study, one of the important ways to create resilient communities is to build cities that are resistant to disasters such as earthquakes. Urban resilience refers to the ability of an urban system—and all its constituent socio-ecological and socio-technical networks across temporal and spatial scales—to maintain or rapidly return to desired functions in the face of a disturbance, to adapt to change, and to quickly transform systems that limit current or future adaptive capacity (Meerow et al., 2016). The findings show that the most emphasized elements will be possible through resilient urban planning.

The findings of this study provide information that will enable us to understand the requirements for a resilient post-earthquake community and to develop plans and policies to address them. Thus, it

reveals that only investing in physical infrastructure will not be sufficient to create a resilient society, but it is possible only if each individual constituting the society is prepared for disasters. Future research should focus on planning to increase communities' resilience by putting existing cities and urban dwellers at the focal point.

Funding

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