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Depremlerin Psikolojik Etkileri ve Deprem Bilincinin Manisa Celal Bayar Üniversitesi Öğrencileri Üzerinden İncelenmesi

Psychological Effects of Earthquakes and Study of Earthquake Awareness Through Manısa Celal Bayar University Students

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Özet

Bu makale, depremlerin aniden ortaya çıkabilen ve kaçınılmaz durumlar olarak algılanan doğası nedeniyle bireylerde güvensizlik, endişe, korku ve travma gibi ciddi psikolojik sorunlara yol açtığını anlatmayı amaçlamaktadır. Depremler, fiziksel çevrenin yanında insan psikolojisini de geniş çapta etkiler. Depremlerin etkisi, sadece maddi kayıplarla sınırlı kalmaz, duygusal sağlığı da derinden etkiler. Deprem sırasında ve sonrasında ortaya çıkan travma, bireylerde uzun vadeli psikolojik sorunlar yaratabilir. Özellikle depremler maddi kayıpların yanında can kaybına da yol açabilir; can kaybı yas sürecini başlatarak depresyon ve üzüntüyü daha fazla tetikler. Depremlerin genel etkilerine odaklanılarak, fiziksel hasarın ötesinde bireylerin ruhsal sağlıklarını da nasıl etkilediği üzerinde durulmaktadır. Bu kapsamda çalışmada önce konuyla ilgili literatür taraması yapılarak depremlerin toplumda yarattığı ekonomik, sosyal ve psikolojik etkiler araştırılarak kavramsal çerçeve oluşmuştur. Sonrasında yüz yüze görüşme tekniği kullanılarak bir alan araştırması yapılmıştır. Bunun için yarı yapılandırılmış görüşme soruları hazırlanıp, depreme maruz kalmış veya kalmamış Manisa Celal Bayar Üniversitesindeki öğrencilerle görüşmeler gerçekleştirilmiştir. Görüşmelerle elde edilen veriler yorumlanarak birtakım çıkarımlar yapılmıştır. Araştırma bulguları ile, öğrencilerin depremlerin neden olduğu psikolojik stresle başa çıkma mekanizmalarını ve bu süreçteki farklılıkları ortaya çıkarması düşünülmektedir. Ayrıca, deprem bilincinin öğrenciler arasında nasıl değişkenlik gösterdiğine ve güçlendirilmesine dair öneriler sunulmaktadır.

Anahtar Kelimeler: Depremler, psikolojik etki, deprem bilinci, öğrenci görüşler.

Abstract

This article aims to highlight the serious psychological issues caused by earthquakes, which are often perceived as sudden and unavoidable events, leading to insecurity, anxiety, fear, and trauma in individuals. Earthquakes, as a prominent threat among natural disasters, affect not only the physical environment but also human psychology on a large scale. The impact of earthquakes goes beyond material losses and deeply affects emotional health. Trauma that occurs during and after an earthquake can create long-term psychological issues for individuals. Particularly, earthquakes can result in both material losses and loss of life, which triggers the grieving process and exacerbates depression and sadness. By focusing on the general effects of earthquakes, it is emphasized how they affect the mental health of individuals beyond physical damage. In this context, the conceptual framework of the study is formed by first reviewing the literature on the subject and investigating the economic, social and psychological effects of earthquakes on society. Afterwards, a field research was conducted using face-to-face interview technique. For this, semi-structured interview questions were prepared and interviews were conducted with students at Manisa Celal Bayar University who were or were not exposed to the earthquake. The data obtained from the interviews were interpreted and some inferences were made. With the findings of the research, it is thought to reveal students' coping mechanisms with psychological stress caused by earthquakes and the differences in this process. Additionally, suggestions are offered on how earthquake awareness varies among students and how to strengthen it.

Keywords: Earthquakes, psychological impact, earthquake awareness, student opinions.

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1. INTRODUCTION

Earthquakes, perhaps one of the most destructive natural disasters and one of the ones that affect human life the most, are events that occur suddenly and shake societies deeply. These events can have a huge impact not only materially but also psychologically. Earthquakes not only shake people's sense of security because they occur unexpectedly and often cause great damage, but also cause psychological reactions such as anxiety and fear. In particular, the sudden and devastating effects of earthquakes can deeply affect people's mental health and cause long-term psychological problems. Therefore, the psychological effects of earthquakes and people's awareness of such natural disasters are of great social importance.

Within the framework of a research conducted on Manisa Celal Bayar University students, it is aimed to examine the psychological effects of earthquakes and earthquake awareness. Earthquakes are not only limited to material damages; they also have profound effects on emotional health. Therefore, it is of great importance to understand the psychological effects of earthquakes on society, especially on the younger generation, and to strengthen earthquake awareness.

The aim of this study is to understand the psychological effects of earthquakes on Manisa Celal Bayar University students and to evaluate how earthquake awareness is shaped in society. The results of this study may contribute to the development of earthquake coping strategies and make society more resilient. In addition, the findings are expected to shed light on the formulation of various public policies to increase earthquake awareness and better prepare people psychologically for such disasters. In this way, it is aimed to minimize potential damage and losses by making society more resilient and conscious against earthquakes.

2. MAJOR EARTHQUAKES IN THE WORLD AND IN TURKEY AND THE SPECIAL POSITION OF EARTHQUAKES AMONG NATURAL DISASTERS

Earthquakes are natural disasters that occur as a result of the geological structure of the Earth. The large stone plates on the Earth's crust are constantly shifting as a result of tectonic movements. Sudden movements at the points of contact between these plates, i.e. fault lines, lead to earthquakes. Large earthquakes are usually characterized by a large shaking and ground movement accompanied by the release of energy.

Worldwide, the regions with the highest earthquake risk are located at the boundaries of active tectonic plates. In particular, the Pacific Ring of Fire is one of the regions with the highest earthquake activity. In this region, the Pacific plate collides with other plates, resulting in frequent large earthquakes. Similarly, other fault lines also host large earthquakes.

Many countries, such as Türkiye, face the risk of earthquakes because they have active fault lines. Türkiye has important fault lines such as the North Anatolian Fault Line in the north, the East Anatolian Fault Line in the east, and the South Anatolian Fault Line in the south. These fault lines are caused by the interaction of the Eurasian, Anatolian, and Arabian plates. Therefore, Türkiye is a country that encounters earthquakes frequently and has experienced many major earthquakes throughout history.

One of the most remarkable earthquakes in Türkiye was the 1999 Gölcük earthquake. This earthquake had a magnitude of 7.6 and caused great destruction and loss. Other earthquakes, such as the 1976 Van earthquake, are also significant and are examples of Türkiye’s earthquake risk.

Earthquakes not only threaten human life and structures, but they can also act as triggers for secondary disasters. For example, an earthquake on the seabed can cause a wave such as a tsunami. Earthquakes can also cause other problems such as landslides, groundwater contamination, and damage to infrastructure.

Therefore, disaster prevention and preparedness activities are of great importance in earthquake-prone regions. Measures such as determination and implementation of safe building standards, creation of disaster plans, establishment of early warning systems and public education are

necessary to minimize the effects of earthquakes. Such measures can also accelerate and facilitate the post-earthquake recovery and recovery process.

Earthquakes are not only limited to physical destruction and loss but also have profound psychological effects. Especially people living in regions with high earthquake risk, such as Turkey, have often faced traumatic experiences related to earthquakes. Due to Turkey's geographical location at the intersection of different active fault lines, there have been many large and destructive earthquakes throughout history. These earthquakes have left deep traces on people's earthquake awareness and psychological resilience.

The special position of earthquakes among natural disasters exacerbates the psychological effects that people experience, such as fear, anxiety, and trauma. In the aftermath of a major earthquake, people often must deal with feelings of safety anxiety, fear, and uncertainty. While the devastation and losses experienced deeply affect people's mental health, the fact that they have to live with constant anxiety about the future and the stress of a possible future earthquake also increases the trauma. The psychological effects of earthquakes can lead to serious problems such as long-term post-traumatic stress disorder, depression, and anxiety.

The psychological effects of earthquakes are not limited to individuals but also affect the general psychology of society. The post-traumatic recovery process of society depends on factors such as access to effective psychological support and counseling services, raising earthquake awareness in society, and establishing disaster preparedness plans. Therefore, measures should be taken to increase the psychological resilience of individuals and society to cope with the psychological effects of earthquakes. Among these, it is important to provide pre- and post-earthquake psychological support services, to increase earthquake awareness in society and to establish disaster preparedness plans. In this way, the psychological stress and trauma caused by earthquakes can be managed more effectively and the long-term recovery process of the society can be supported.

2.1. Major Earthquakes in the World

In the history of the world, earthquakes, one of the biggest natural disasters faced by humanity, have deeply affected people's lives and their environment for years. These earthquakes demonstrate not only the destructive power of natural disasters but also the resilience and preparedness of humanity. Here are some of the major earthquakes in various parts of the world that have left their mark throughout history:

2.1.1. Great Sumatra-Andaman Earthquake (2004)

The Great Sumatra-Andaman Earthquake of 2004 occurred off the coast of Sumatra Island and was measured with an instantaneous magnitude (Mw) between about 9.1 and 9.3. This earthquake was the result of a fault slip on the west of Sumatra Island and caused a devastating tsunami. The tsunami affected many countries, including Indonesia, Sri Lanka, India, and Thailand, killing around 230,000 people and leaving millions homeless. This earthquake and tsunami highlighted the seismic complexity of the region and the importance of pre-earthquake warning systems (Lay et al., 2005).

2.1.2. Southern California Seismic Activity

Southern California is a region of significant seismic activity in the USA. This region is crossed by the San Andreas Fault and many other fault lines and accounts for about half of the seismic activity worldwide (Gutenberg & Richter, 1944). In particular, the Owens Valley, located in the southern part of the San Andreas Fault, near major cities such as Los Angeles and San Diego, is a region where earthquakes occur frequently. Seismic activity in Southern California is an important topic of research in earthquake science and disaster management, and it is crucial that communities in the region are prepared for earthquake risk.

2.1.3. Increasing number of major earthquakes

Between 2004 and 2014, there was a marked increase in the frequency of large earthquakes ($Mw \geq 8.0$). Research has shown that there was a 265% increase in seismic activity during this period (Lay, 2015). This increase highlights the importance of geological and seismological research to better

understand the causes and triggers of earthquakes. Furthermore, communities in earthquake zones need to update their disaster preparedness plans and be better prepared for disasters.

2.1.4. Seismic Instantaneous Release Rate

A comprehensive catalog of large, shallow earthquakes between 1900 and 1989 highlights the irregularity of the seismic instantaneous release rate dominated by a few large events (Pacheco & Sykes, 1992). This finding suggests that more research is needed to understand the triggers of large earthquakes and the variations of seismic activity over time. Furthermore, the development of pre-earthquake warning systems and disaster preparedness plans can help communities to be better prepared for earthquake risk.

2.1.5. 2014 Iquique Earthquake and 2011 Tohoku-Oki Earthquake

The 2014 Iquique earthquake (Mw 8.1) in Chile was preceded by intense foreshocks and a slow slip event, illustrating the complexity of seismic processes leading to large earthquakes (Ruiz et al., 2014). Similarly, the 2011 Tohoku-Oki earthquake (Mw 9.0) is a prominent example of large earthquakes occurring along ocean trenches, revealing the potential for megathrust earthquakes in regions with high-stress accumulation rates (Ozawa et al., 2011).

These major earthquakes are important examples of the development of earthquake science and disaster management policies. Continued research and seismological observations can help societies to be better prepared for disasters and reduce the risk of earthquakes.

2.2. Major Earthquakes in Türkiye

Türkiye is a country under constant earthquake risk due to its geological location. Particularly, major fault lines such as the North Anatolian Fault and the East Anatolian Fault Zone increase the earthquake potential of the country. Studies focusing on Türkiye's seismic history provide important findings about the large and destructive earthquakes that have occurred in the country.

The year 1999 marks an important turning point in Türkiye's earthquake history. The August 17, 1999, Izmit Earthquake was recorded as one of the most destructive earthquakes in the country's recent history. This earthquake, which occurred along the North Anatolian Fault, caused a great loss of life and property and raised serious concerns about the earthquake risk in Türkiye (Barka, 1999). In the same year, the Erzincan Earthquake occurred, one of the most destructive earthquakes since 1939 (Toksöz et al., 1999). These two major earthquakes raised awareness of Turkey's earthquake risk and led to the initiation of a series of studies to examine seismic activity.

Large earthquakes along the North Anatolian Fault have been an important topic not only in Turkey but also in earthquake science. These earthquakes have provided valuable data on earthquake stress triggering and prediction. Particularly, Stein et al. (1997) analyzed large earthquakes along the North Anatolian Fault between 1939 and 1992 and showed that stress changes increase the probability of future large earthquakes.

The neotectonics of Türkiye constitute an important part of seismic research. Bozkurt (2001), analyzing the neotectonic features of Türkiye, stated that the country is one of the most actively deforming regions worldwide and important fault zones such as the North Anatolian Fault Zone (NAFZ) and the East Anatolian Fault Zone (EAFZ) play a critical role in Türkiye seismic activity.

The 1999 Kocaeli and Düzce Earthquakes once again emphasized the potential impacts of seismic activity in Türkiye. These earthquakes showed how great the economic and human losses in the region could be (Şahin & Tari, 2000).

The most recent earthquake in Türkiye, centered in Elbistan, occurred on February 6, 2023, in the Elbistan district of Kahramanmaraş province in Türkiye. This earthquake was recorded with a magnitude of 7.7. On the same day, an earthquake with a magnitude of 7.8 also occurred in Pazarcık district of Kahramanmaraş. Both earthquakes affected neighboring provinces and caused serious damage.

The loss of life and property caused by earthquakes has been considerable. According to the Disaster and Emergency Management Presidency and the Ministry of Environment, Urbanization and Climate Change, the cost of these earthquakes amounted to approximately 104 billion dollars. In addition, nearly 17,000 aftershocks occurred in the aftermath of these earthquakes.

These earthquakes were recorded as the second and third-largest earthquakes in Türkiye's history. It caused serious damage to the infrastructure in the surrounding provinces and negatively affected the daily lives of people living in the region. Many houses and workplaces were destroyed or moderately to severely damaged as a result of the earthquake.

Such major earthquakes make it important to raise the awareness of people living in earthquake-prone regions such as Türkiye on earthquake preparedness and disaster management and to take necessary measures.

3. EFFECTS OF EARTHQUAKES ON SOCIETY

Earthquakes are natural and destructive disasters that are unknown before they occur or cannot be predicted with certainty. Earthquakes cause different effects on people and society in the region where they live. Earthquakes that cause very severe destruction can cause major changes in unprepared countries. The earthquake disaster experienced frequently in our country causes loss of life and property. Earthquakes, in general, affect people's lives economically, socially, and psychologically. In this section, the economic, social, and psychological problems experienced in that region after the earthquakes will be mentioned.

3.1. Social and Economic Problems After Earthquakes

Between 1980 and 2008, earthquakes around the world caused approximately 600,000 people to lose their lives and over 400 billion dollars in economic losses. The effects of earthquakes on the economy can be considered as real estate losses, damages to movable assets, economic losses due to business interruptions, economic costs in the public sector, and loss of family income in cases such as death and injury (Marangoz and İzci, 2023).

Among natural disasters, earthquakes are known to be the most destructive and cause serious damage to individuals and the environment when they occur. These damages negatively affect daily life in various ways, and routine life in the earthquake-stricken area is disrupted. Some individuals lose their homes in the disaster, and those who have insurance coverage are compensated by the insurance company. If the covered damage consists of high payments, it causes an increase in insurance premiums and this increase causes disruption in the economy. Earthquakes cause serious damage to the infrastructure in the region where they occur. For example, when critical infrastructure lines such as roads, bridges, communication lines, and energy transmission lines are damaged in earthquakes, economic activities are disrupted. In this case, trade comes to a standstill or even stops, and job losses occur. After the earthquake, citizens living in the disaster area experience a loss of income due to the earthquake. To get rid of this situation and to have better job opportunities, labor migration may be needed. Possible migrations may take place within the province, outside the province, or outside the country. For example, the earthquakes in Kahramanmaraş on February 6, 2023, damaged the infrastructure in that region and caused problems in industrial and production facilities, thus causing serious damage to people. Due to the high damage and losses caused by the earthquake, weather conditions, and constant aftershocks, it was observed that approximately 3.3 to 5 million people moved away from the earthquake zone, and eight hundred thousand people migrated temporarily or permanently to villages and places where they would feel safe (Şeker, 2023).

In the reconstruction phase, people who aim to take advantage of entrepreneurship opportunities may prefer to stay in disaster areas and benefit from disaster-related employment opportunities (Marangoz and İzci, 2023). The reconstruction process brings great financial difficulties. In this process, a long time is needed to build modern and earthquake-resistant structures, which can strain the state budget as well as the financial situation of the people.

Building resilient cities is of great importance in the reconstruction process. A resilient city has many definitions. According to the definition of the Organization for Economic Cooperation and

Development (OECD), resilient cities are cities that are prepared for future environmental, economic, social, or public crises, are able to eliminate these crises in advance, and have the ability to positively transform their systems in the face of these adverse conditions (OECD, 2018). In another definition, resilient cities are settlements that can take under control the situations that the security structure of the city sees as threats or pressures and have the capacity to continue their functions under all conditions (Irdem & Mert, 2023: 244). On the other hand, as to the general definition of Dursun and Boncuk; resilience in the sense of "struggle and survival under sudden shock and stress conditions" is defined as increasing the capacity of cities to withstand risks that threaten their economic, social, and ecological positions and reducing their vulnerability. Therefore, resilience aims to reduce risks in urban planning and design processes by predicting the effects of risks and crises that may occur in cities in advance (Dursun and Bozcuk, 2024: 371).

Resilient structures are designed to withstand natural disasters such as earthquakes, storms, floods, and fires. Such structures are built using robust building materials, strong foundation systems, and appropriate engineering principles. Disaster-resistant structures minimize the possibility of collapse or damage by maintaining their structural integrity. Components such as reinforced columns, shear walls, and vertical-horizontal structural systems are among the important elements that increase the resilience of these structures (Bilgehan, 2023: 294).

These definitions and building strategies aim to increase the resilience of not only the physical infrastructure of cities, but also their social and economic structures. Resilient city and building models aim to protect both individual safety and social order in the face of future disasters and crises. By implementing the necessary policies and engineering solutions to ensure this resilience, governments and local authorities can support the sustainable development of cities in the long term. This approach will contribute to both mitigating current risks and preparing for future threats.

In this sense, the Law on Municipalities assigns certain duties to municipalities, which are responsible for the management of cities, to take precautions for earthquakes and other disasters. For example, Article 53 of the Law requires municipalities to make disaster and emergency plans to reduce the damage of natural disasters, to prepare teams and equipment, to ensure coordination in emergency plans, to take necessary measures for public education and to make joint plans with other institutions and organizations. Article 73 of the Law also authorizes municipalities to implement urban transformation and development projects for measures against earthquake risk (Municipal Law No. 5393, Articles 53-73). In addition, other laws also assign duties to municipalities. For example, the Law on the Renewal, Protection and Utilization of Historical and Cultural Immovable Assets by Renewal also states in its purpose section that it is necessary for municipalities to take measures against natural disaster risks (Law No. 5366/art.1). However, municipal administrations, which do not have sufficient resources, authority, incentives, personnel, information and technical equipment related to natural disaster risks and disaster management, mostly support post-earthquake relief and rescue activities. In fact, the duties and functions of municipal governments in the creation of earthquake-resilient cities should not be limited to the duties assigned by law. Municipalities can also take measures that may create disaster risk while performing other duties. For example, they can do this most obviously when creating zoning plans. They can also create earthquake resilience measures in many fields of activity such as population planning, land use, site selection, urban development form and transportation systems, and determination of evacuation routes (Dursun and Bozcuk, 2024: 372).

Earthquakes have social consequences as well as economic consequences. The psychology of individuals affected by the disaster undergoes a change and this is expected to have negative effects on relationships and social structure. These post-disaster problems cause individuals to face social problems in their lives. It is observed that the social structure is damaged during and after the disaster, the functioning of various institutions is disrupted, some social values, attitudes, and behaviors of individuals change (Fırat, 2022).

Earthquakes actually test the resilience of society. People's normal living standards are turned upside down by earthquakes. The disaster shakes the existing social order and causes some problems in the society and a new organization is needed. While these deficiencies can be overcome in a short time in developed countries, developing countries are weak in this regard and the society is not

sufficiently prepared for disasters. When people are caught unprepared for earthquakes, it affects their living standards (shelter, food, clothing, etc.). As a result, "social inequalities" occur in the society. People with a high standard of living can usually relocate to other places, but people without means stay in the area.

Earthquakes also negatively affect the family institution and shake its basic dynamics. These natural disasters suddenly and negatively change the daily routines of family members and damage their social relations, so problems such as disharmony, violence, and divorce begin to emerge within the family (Fırat, 2022). Another problem that develops after the earthquake is epidemics. Common tent areas are established for families who lost their homes in the disaster. These areas are generally crowded, so hygiene becomes a problem. The common use of toilets and bathrooms in these areas, as well as the lack of good infrastructure systems, increases the risk of epidemics. And finally, another problem is the insecure environment and looting. As people leave their homes for their lives, most of their belongings remain in their homes and some malicious people enter and loot valuable items even though the house is damaged. This situation is not limited to houses, shops, markets, etc. are also looted.

3.2. Psychological Effects of Earthquakes on Society

When the effects of disasters are considered, the first thing that comes to mind is the loss of life and property, but the physical and psychological damages that occur later are of great importance. These psychological problems can affect not only those directly exposed to the disaster, but also the relief teams, the relatives of those exposed to the disaster, and those who witness the events through the media (Altun, 2018). The physical, psychological, and social effects of an earthquake often cause traumatic effects by directly affecting the functionality of individuals. The fact that this event is mostly traumatic, intense feeling of fear, unpredictability, uncontrollability, and destructive nature are among the factors that challenge individuals. Disasters can disrupt the integrity of an individual's life and shake their sense of trust (Nakajima, 2012). The fact that earthquakes usually target the basic area that ensures the safety of the home and even the complete destruction of the living space poses a vital threat to the individual. The difficulties that survivors face in the first stage may eventually manifest as posttraumatic stress disorder (PTSD), depression, anxiety, and other psychological or physical stress symptoms (Bıçakçı & Okumuş, 2023).

To determine the effects of an earthquake, an assessment is usually made by considering the distance from the center of the event. In this context, those who are directly affected by the earthquake, those trapped under the rubble, those who have lost relatives, those who have been injured, and those who have experienced major changes in their physical and social environment may be more emotionally affected. In addition, a large segment of the society, who have acquaintances or loved ones in the disaster area, who witness the event, who work both on duty and as volunteers, who provide support and interact through aid, also experience affective effects (Bıçakçı & Okumuş, 2023).

In the aftermath of an earthquake, there may be different reactions among disaster survivors. While some individuals appear to be seemingly unaffected, others may exhibit dramatic reactions. Attention and concentration difficulties, fear, frequent thinking about the event, dullness, numbness, lethargy, sleep problems, dreaming about the event, sadness, and anger are among the symptoms frequently observed in the first days after the trauma. The presence and pattern of symptoms may vary depending on the sociocultural status of individuals. For this reason, it should not be assumed that individuals who appear to be in good psychological condition in the initial evaluations are coping well with the process or that it is healthier not to have psychological problems after a severe trauma such as an earthquake. Psychological reactions that develop after trauma may show different characteristics from individual to individual (Sönmez, 2022).

It is very normal for all individuals to experience these effects in the first days and even in the first few months after an earthquake. These reactions diminish over time and gradually the mourning process begins. This process varies according to the losses experienced by individuals and the importance of the losses. When the mourning process is over, the disaster is accepted and becomes a part of life. After earthquakes, psychological support is provided to make the traumas a little easier.

The earthquakes centered in Kahramanmaraş last year are an important example from a psychological perspective. The earthquakes centered in Kahramanmaraş caused radical changes in the lives of individuals and caused psychological distress. People who had a regular life before the earthquake experienced emotional distress such as stress, fear, and depression due to the losses they suffered after the earthquake. Some people expressed that they lost the meaning of their lives, thinking that it was impossible to regain what they had lost (Bozkurt, 2023).

While earthquakes cause great loss of life and property, they also damage social life, economic situation, and people's physical and mental health in the region where they live. Earthquakes cause different consequences and cause disruptions in daily life.

4. EFFORTS TO CREATE EARTHQUAKE AWARENESS IN SOCIETY

Earthquake awareness-raising activities in society are activities carried out to reduce the existing effects of earthquakes and to make society prepared for such natural disasters. These activities aim to enable individuals to understand the risks posed by earthquakes, to develop protection methods and to increase resilience against disasters throughout society. The main purpose of these activities is to increase the sensitivity of society against the dangers that may occur in earthquakes and to encourage society to act in a conscious and prepared manner.

4.1. A Field Study on Manisa Celal Bayar University Students to Measure Earthquake Awareness

The field of this study consists of students studying at Manisa Celal Bayar University. Interviews were conducted with 10 volunteer students studying at the university. 5 students were affected by the earthquake and answered the questions we asked about the moments they experienced during the earthquake. The other 5 students were not affected by the earthquake, but they shared their opinions about the earthquakes and future earthquakes.

4.1.1. Purpose and Scope of the Study

The research conducted on the students of Manisa Celal Bayar University aims to contribute to the development of more effective awareness-raising strategies in society by shedding light on the earthquake awareness-raising processes of the young generation by focusing on studies in this context. Interviews were conducted with 5 earthquake-affected and 5 earthquake-unaffected students studying in different departments at Manisa Celal Bayar University. Different questions were prepared for both groups and the interviews were conducted face-to-face.

4.1.2. Research Methodology

In this study, the semi-structured interview method, one of the qualitative research techniques, was preferred as the data collection method. If we define the interview technique most simply, it can be defined as obtaining information from the relevant person(s) on a subject within the scope of the questions to be asked. In other words, a qualitative interview is to collect extensive information about a subject by asking the interviewee detailed questions about the nature of the subject. Such interviews are called in-depth interviews or interviews. The number of people may vary according to the subject and purpose of the research (Aziz, 2014: 85-86). This method does not carry the rigid structure of fully structured interviews, but at the same time, it contains the flexibility of fully unstructured interviews. In this way, the research process both proceeds within a certain framework and provides a freer and more in-depth interaction with the participants. Before preparing the interview questions to be addressed to the students studying at this university, a literature review was conducted and the questions to be included in the interview form were prepared. The data obtained through face-to-face interviews and observations were evaluated through descriptive analysis. When we look at the field literature, the analysis method is generally applied in two ways. These are “descriptive analysis” and “content analysis” used by Yıldırım and Şimşek in their book based on Strauss and Corbin's suggestion. According to the descriptive analysis approach, the data obtained are summarized and interpreted according to predetermined themes (Yıldırım & Şimşek, 2013: 255-256).

4.1.3. Research Findings

Demographic information about the participants interviewed in the study is presented in Table 1 below:

Table 1: Demographic information of participants

Participant	Age	Gender	City of Residence
A1	23	Male	Hatay
A2	21	Female	Hatay
A3	23	Male	Adana
A4	20	Female	Diyarbakır
A5	22	Female	Kahramanmaraş
B1	22	Female	Bilecik
B2	21	Female	Manisa
B3	22	Male	İzmir
B4	21	Male	Ankara
B5	20	Male	Ağrı

A: People affected by the earthquake

B: People not affected by the earthquake

In this part of the study, the findings obtained during face-to-face interviews will be mentioned. The participants were divided into two groups: participants who experienced an earthquake and participants who did not experience an earthquake. Different questions were prepared for both groups. A total of 15 questions were asked to both groups. After this section, the questions asked in the interview will be written and the data obtained will be added under the questions.

Question 1A: Where were you when the earthquake happened?

A1: I was sleeping at home on the day of the earthquake.

A2: I was at home, sitting with my family during the earthquake.

A3: I was at home and sleeping when the earthquake happened.

A4: I was at home during the earthquake, watching TV in the living room.

A5: The earthquake happened at night, and I was sleeping then.

According to the answers of the respondents with the pseudonyms A1, A3, and A5, people state that they were at home and sleeping at the time of the earthquake. Being at home may indicate that the person thinks they are in a safe place during an earthquake or that they are in a place where they are often found. However, being asleep means that one may have difficulty recognizing the onset of an earthquake or reacting quickly. At the same time, being asleep may mean that a person may not recognize the earthquake immediately or react correctly during an earthquake. Being at night means that people are asleep during the earthquake and may not be aware of the earthquake. This may mean that they may be more confused when they wake up after the earthquake or when they feel the earthquake.

The responses of participants with the pseudonyms A2 and A4 indicate that they were engaged in various activities during the earthquake. Participant A2 states that he was at home with his family and they were sitting together. This may indicate that the person felt safe and had the opportunity to act together during the earthquake. Moreover, being with family members can reduce post-earthquake stress and strengthen the sense of solidarity. In the answer given by participant A4, the person states that he/she was at home in the living room watching television during the earthquake. Watching television, an indoor activity, is one of the activities that people usually do at home during an

earthquake. However, feeling the earthquake while watching TV can help the person to react quickly or to better understand the post-earthquake situation.

Question 2A: How did you react during the earthquake?

Some of the participants said that they were asleep during the earthquake and woke up scared. Other participants who were not sleeping said that when they felt the tremor, they experienced anxiety and panic as well as fear.

Question 3A: Have you experienced any changes in your mood after the earthquake?

A1: Yes, I have become more of a cool-headed person, I am calmer and more fearless.

A2: Yes, I have experienced many changes, every building I enter scares me.

A3: Yes, I became withdrawn for a short time.

A4: Yes, now I am more afraid of losing my loved ones.

A5: Yes, the fear occurred and still continues.

These responses reflect different emotional reactions of individuals after the earthquake. In the first response, the person states that they are calmer and more composed after the earthquake, possibly because they have developed better coping skills to deal with the earthquake experience. In the second response, the person states that they feel fear every time they enter a building, which may indicate that the feeling of insecurity caused by the earthquake is still effective and that the person is experiencing post-traumatic stress. The third answer indicates that the person emotionally withdrew and withdrew after the earthquake, which may indicate that the impact of the trauma caused by the earthquake has affected the person's social and emotional life. In the fourth answer, the person states that they are more afraid of losing loved ones, which may reflect the depth of anxiety and worry caused by the earthquake. In the last answer, the person states that they still feel fear after the earthquake and that this feeling persists, which may indicate that the impact of the trauma caused by the earthquake has had a long-lasting effect on their mood. These responses show that the psychological effects of the earthquake on individuals are varied and vary from person to person.

Question 4A: What kind of effects did you feel in your daily life after the earthquake? (Sleep disturbance, eating habits, etc.)

They felt various effects on their daily lives after the earthquake. Most of the students stated that their sleep patterns were disrupted for a long time after the earthquake. They said that they no longer had uninterrupted sleep and woke up at the slightest sound. In the first days after the earthquake, they were afraid to sleep at night and would wake up immediately in case of an aftershock and were worried. The fatigue they experienced due to lack of sleep and sleep deprivation affected their daily activities and made it difficult for them to concentrate on their studies. Some students also reported changes in their eating habits after the earthquake. They reported a reduced appetite due to stress and anxiety and, for some, a reluctance to eat. This shows that the emotional stress caused by the earthquake also affected their physical health. During this challenging time, the students tried to cope with these changes with a supportive environment and emotional support.

Question 5A: Did you experience psychological problems after the earthquake that disrupted your work or school?

In this question, participants stated that they did not experience significant psychological problems that would disrupt their lives. However, they talked about the impact of the events. The students emphasized that their experiences after the earthquake changed their lives and they were not the same as before. The moments of fear and anxiety of the earthquake left deep scars on their minds and they expressed their fear of reliving the same events. The psychological effects of the earthquake are evident in the fact that they have difficulty sleeping at night and that they wake up immediately and worry about any aftershocks. It can be assumed that students benefited from a supportive environment to cope with these emotional challenges. Being aware of the emotional changes they

experienced during this process and expressing these feelings can be an important step in the emotional healing process.

Question 6A: When you talk to people around you about the psychological effects of the earthquake, what feelings and thoughts do they share?

A1: They share their sadness about the people they lost.

A2: People tell that they are still in fear and anxiety. They liken those days to doomsday.

A3: They share that things should not be postponed in life and that we should appreciate every moment.

A4: They say that they feel sorry for the people who lost their loved ones and that the thought of losing their loved ones scares them more.

A5: They tell what happened on the day of the earthquake.

These answers reflect the different feelings and thoughts of the people around them about the psychological effects of the earthquake. In the first answer, people share their grief over the loss of people, which may indicate that the devastating impact of the earthquake has left deep scars in people's lives. In the second response, people expressed that they are still feeling fear and anxiety, likening the earthquake to a doomsday. This may indicate that the trauma of the earthquake has left deep traces in people's minds and that the fear and anxiety after the earthquake still persists. In the third response, people shared the idea that every moment should be cherished and that things in life should not be postponed. This may indicate that the experiences of the earthquake have changed people's perception of life and led to a reassessment of priorities. In the fourth response, people mentioned that they grieve with those who lost their loved ones and that this anxiety is deepened by the fear of losing their loved ones. In the last answer, people talked about what happened on the day of the earthquake, indicating that the impact of the earthquake on people and their experiences are still fresh. These responses show that the earthquake has had a variety of emotional and mental impacts on society and that people are trying to find different ways to cope with their experiences after the earthquake.

Question 7A: Did you receive psychological support after the earthquake?

The answer of all participants to this question was 'no, I did not receive psychological support'.

Question 8A: How do you plan to prepare yourself and the people around you in case of a future earthquake? Can you give information about the measures you have taken?

A1: I think that we should definitely not live in multi-story buildings, that every citizen should have an earthquake bag, and that our citizens living on fault lines in earthquake zones, especially our children, should be made aware of this issue.

A2: I think I will act more consciously.

A3: If I experience another earthquake, I will stay calm and act in accordance with earthquake awareness.

A4: With the earthquakes we have experienced, we have realized that buildings should be built more robustly, so I will tell my neighbors to pay attention when renting or buying a house.

A5: We plan to live in a sturdy house. We now have the knowledge to predict what might happen in case of an earthquake. I think it should be compulsory to have strong shelter areas against bad situations.

These responses reflect a variety of strategies and considerations for preparing for a future earthquake. The first answer emphasizes the importance of prioritizing living in earthquake-resistant buildings and highlights the need to have an earthquake kit. It also states that children should be made aware of this issue. The second answer takes a more general approach, emphasizing the importance of acting consciously. The third answer aims to stay calm and act in accordance with earthquake awareness. The fourth answer draws attention to the robustness of the buildings after these earthquake

experiences and advises the people around them to be careful when choosing a house. The last answer emphasizes the importance of safe shelters in case of an earthquake, in addition to planning to live in a sturdy house. These responses reflect different approaches and measures for earthquake preparedness and emphasize the importance of steps to increase public awareness of earthquakes and ensure safety.

The interview questions and answers prepared for the students who were not affected by the earthquake are as follows:

Question 1B: Do you have any relatives affected by the earthquake?

While 1 of the students answered yes to this question, the other students answered no.

Question 2B: What kind of emotions and reactions do you think you would have in case of an earthquake?

B1: First of all, I would be very scared, panicked, and anxious. On the other hand, I would try to stay calm and relax myself, and act rationally.

B2: In the earthquakes I have experienced, I have tried to keep my cool. Of course, in some of them, the fear and panic I felt was too much, but I tried to keep it under wraps as much as I could, at least during the earthquake.

B3: I think I would feel fear and adrenaline, but I would not lose control.

B4: I think I would be scared and worried if the magnitude of the earthquake was very big and there were casualties, I would feel sad.

B5: I would probably be very scared, but I would keep my calm.

According to this question, in which the participants evaluated their feelings and reactions to an earthquake, the general tendency is that they would feel fear in the event of a possible earthquake. Although each participant expressed feelings of fear, anxiety, or panic, an important common theme was the effort to maintain emotional control despite these feelings. The first participant tends to focus on staying calm and acting rationally despite the fear. The second participant indicated that she tries to handle her emotional reactions in a calm manner, drawing on her past experiences. The third participant stated that she would experience feelings of fear and adrenaline but believed that she would not lose control. The fourth participant stated that she would feel sadness in case of a big earthquake and loss of life. The fifth participant stated that although she would probably be very scared, she would try to keep her calm. In general, participants were trying to cope with their emotional reactions and maintain control during the earthquake.

Question 3B: How much do you know about earthquakes in general?

B1: I know as much as I am told in schools or trainings.

B2: I know general information that everyone knows.

B3: Above average level.

B4: I don't think I have too much knowledge.

B5: Not very much. As much as the information I learned from earthquake survivors I met on social media.

These answers indicate the level of knowledge and sources of information about the earthquake. Responses B1 and B2 indicate that people generally have knowledge about earthquakes, probably acquired at school or through general social awareness-raising activities. Answer B3 implies that the person has a moderate level of knowledge, perhaps through extra research or interest in the topic. Answer B4 indicates that the person considers their level of knowledge to be low, which may indicate a need to learn more about the topic. Answer B5 indicates that the person got their information about the earthquake from sources such as social media and may have doubts about the accuracy or details of this information. These answers reflect the diversity of the level of knowledge about earthquakes and the habits of obtaining information.

Question 4B: Have you had your house checked for earthquake resistance after the earthquakes?

Respondents' attitudes towards earthquake resilience are quite diverse. First of all, most respondents did not have the durability of their houses checked after the earthquakes, which may indicate a general neglect of post-earthquake precautions.

The only respondent who stated that he/she has had his/her resilience checked represents a minority that attaches importance to post-earthquake safety measures. The fact that other respondents do not make any effort in this regard may indicate a widespread lack of awareness in society about earthquake preparedness.

Respondents who consider their homes to be resilient are likely to have undertaken structural retrofits or earthquake resilience measures. However, respondents who thought their homes were unstable may have been aware of a potential risk or may have experienced a situation where the building stock in their area was generally not earthquake-resistant.

In conclusion, the variation in respondents' perceptions of the resilience of their homes may reflect a general lack of awareness in the community on earthquake preparedness and safety awareness, as well as inconsistencies between individuals. This may emphasize the importance for individuals living in earthquake-prone areas to focus more on post-earthquake safety measures.

Question 5B: What kind of precautions have you taken or do you plan to take about earthquake risk and preparedness after the earthquakes?

B1: I prepared an earthquake kit like everyone else does. I plan to take trainings about earthquakes to be more conscious.

B2: I prepared an earthquake kit and made my family aware of this issue. We also practiced earthquake drills.

B3: We prepared an earthquake kit and decided where to gather in case of danger.

B4: We gathered the items that can form a life triangle at home, bought whistles for everyone, and created an earthquake bag.

B5: We prepared an earthquake bag. We will also have our house tested for earthquake resistance.

These answers reflect people's precautions and thoughts on earthquake risk and preparedness. Answer B1 indicates that the respondent prepared an earthquake bag as a basic precaution and that she is planning to get training on earthquakes to learn more about earthquakes. Answer B2 states that in addition to preparing an earthquake bag, the respondent raised awareness among her family and practiced earthquake drills. Answer B3 states that in addition to preparing an earthquake kit, the family decides where to gather in case of danger. Answer B4 stated that they took additional precautions such as creating a life triangle at home and providing whistles for each individual and prepared an earthquake kit. Answer B5 states that in addition to preparing an earthquake bag, they would have their homes tested for earthquake resistance. These answers show that people have taken various measures for earthquake preparedness and have taken various steps to increase their safety.

Question 6B: What do you think about earthquake awareness? Do you think there is sufficient awareness in the society in general?

B1: We all know that our country is an earthquake zone, but as a society, I don't think that we take such disasters into consideration and that we have sufficient awareness. At the same time, people only come to their senses about earthquakes when events occur, and after a certain period of time, they forget and continue to make mistakes, knowing that destruction will occur in the same way.

B2: I think with the Kahramanmaraş earthquakes, people realized the seriousness of possible earthquakes and their possible consequences as an earthquake country. However, I don't think we have reached a sufficient rate of taking action or taking the right action. In addition, supervision and sanctions should not be compromised in many areas, especially in the construction sector.

B3: I think that earthquake awareness is very important but not sufficiently developed in our society.

B4: No, I don't think so, I don't think there are enough trainings.

B5: I think the society has become more aware after the recent earthquakes.

Participants' opinions about earthquake awareness are generally that there is not enough awareness in society. One participant (B1) stated that although we know that our country is an earthquake zone, we do not pay enough attention to these disasters as a society and our level of awareness is low. At the same time, he emphasized that awareness about earthquakes usually increases when events occur and is forgotten over time, so the same mistakes can be repeated. Another participant (B2) stated that the earthquakes in Kahramanmaraş made people aware of the seriousness of the real risks as an earthquake country, but that there is still not a sufficient level of mobilization. Other participants (B3, B4) also stated that they think that earthquake awareness has not developed in society and that adequate trainings are not provided. However, one participant (B5) stated that he thought that the recent earthquakes raised awareness in society. In general, although there is not a homogeneous consensus among the participants about earthquake awareness, there is a common concern that more awareness should be raised in society.

Question 7B: What kind of information have you received about earthquakes from the media or your environment? How did this information affect your understanding of earthquakes?

B1: I have learned about earthquakes from social media and news channels, and about the fault lines depending on the location of our country. Thanks to the information I acquired, I have become more conscious. For example, when I buy a house, I check whether it is on a fault line or not, or I make sure that it is not too high-rise.

B2: I have used the media to share information about what needs to be done for help rather than discussing what happened. I realized that there would be no excuse for me to postpone what needs to be done to be cautious in a possible earthquake.

B3: I have received criticism related to politics. It made me think that our country is not ready for earthquakes. I am especially worried about the expected Great Istanbul earthquake.

B4: I learned that we should be careful and which parts of the buildings are strong.

B5: That we should not panic and make wrong decisions during an earthquake. I received information on how to behave during an earthquake. I learned that with the right behaviors, I can survive the earthquake with very little damage.

5. FINDINGS AND DISCUSSION

This study provides valuable data on the psychological and behavioral effects of earthquakes on individuals, based on face-to-face interviews with both affected and unaffected individuals. Considering the demographic information of the participants, it was observed that the group affected by the earthquake (Group A) was mostly at home and often asleep during the quake. This suggests that being at home and being asleep might have made it more difficult to notice the onset of the earthquake and respond quickly. On the other hand, participants who were engaged in various activities during the earthquake were able to sense the tremors better, leading to more pronounced reactions.

Among the psychological changes observed post-earthquake, some participants reported becoming more composed, while others experienced symptoms such as fear, anxiety, and social withdrawal. These findings indicate that the psychological effects of earthquakes vary among individuals, with some being more resilient to trauma and others experiencing profound psychological impacts. Insomnia and changes in eating habits following the earthquake highlight the physical and psychological effects of the event. Participants experienced symptoms such as sleeplessness and loss of appetite, which adversely affected their daily lives and academic performance.

Notably, a significant majority of earthquake-affected participants did not seek psychological support. This may indicate difficulties in accessing psychological support services and a lack of

societal awareness. Regarding post-earthquake preparedness and measures, participants have developed various strategies, with emphasis on preparing emergency kits and ensuring building resilience. However, among these measures are also practices such as checking the durability of homes, focusing on building safety, and conducting drills. This suggests that while there has been an increase in earthquake awareness and preparedness within the community, there are still areas needing improvement.

Participants who were not affected by the earthquake (Group B) expressed that they would experience various emotions and reactions in the event of a future earthquake. Fear, panic, and anxiety were prominent feelings, although some participants indicated a willingness to manage these emotions more consciously. Regarding earthquake knowledge, the level of information varied, with some individuals possessing only general knowledge and others tending towards a more detailed understanding. The perception that earthquake awareness is not sufficiently developed, and that education is lacking highlights the importance of increasing preparedness and safety awareness. Information obtained from the media and surroundings has shaped individuals' understanding of earthquakes, demonstrating that such information has a significant impact on both preparedness and responses.

In conclusion, the effects of earthquakes on individuals are evaluated across a broad spectrum. The psychological and physical impacts experienced by both affected and unaffected individuals underscore the need to enhance the community's earthquake awareness and preparedness levels. Strengthening post-earthquake support mechanisms and increasing educational efforts are crucial steps for better psychological and physical preparedness. The findings of this study emphasize the need for developing earthquake preparedness and response strategies and improving societal awareness and education levels.

6. CONCLUSION AND SUGGESTIONS

The results of this study have revealed that earthquakes have profound and various psychological effects on individuals. Earthquakes caused emotional reactions such as panic, fear, and anxiety in the participants, and these effects continued after the earthquake. The participants stated that the emotional changes they experienced after the earthquake appeared in the form of introversion, sleep disorders, and a constant state of anxiety. This situation shows that earthquakes can have long-term and permanent effects on the mental well-being of individuals.

Research findings have also revealed that earthquake awareness and preparedness in society are at variable levels. While some individuals have limited knowledge about earthquakes, others have stated that they have a more comprehensive knowledge. The recent earthquakes have caused an increase in awareness in society, but in general, an adequate level of earthquake awareness and preparation has not been reached. In this context, the necessity of increasing earthquake awareness and raising the level of preparedness is emphasized.

The role of media and social media also stands out as an important finding. The media increases the awareness of society about the earthquake by providing accurate and reliable information and encourages individuals to be prepared. Information provided through the media plays a critical role in increasing earthquake awareness and strengthening social preparedness.

In this context, some suggestions are emerging. Firstly, it is necessary to strengthen professional psychological support services to reduce the effects of psychological traumas experienced after the earthquake. This support can be provided through professional counseling and support groups, and the mental well-being of individuals can be supported. In addition, continuous education and awareness-raising activities should be organized in order to increase earthquake awareness in society. Schools and universities, local governments and other relevant institutions should conduct regular educational programs and events on earthquake safety and preparedness.

Considering the role of the media, the sensitivity of media organizations in providing accurate and reliable information should be increased. The media is an important tool to inform the public and encourage their preparedness. It is also important to strengthen social solidarity and cooperation.

Increasing social solidarity and providing support to earthquake victims after an earthquake can increase social resilience and accelerate the recovery process.

On the other hand, it should not be forgotten that disaster governance is a very important approach for raising earthquake awareness and solving post-earthquake problems. In this sense, planning activities to be carried out for disasters, raising public awareness on disasters, making building inventories, conducting risk analyses, post-earthquake rescue activities and all activities that will facilitate the return to normal life can only be effective under the interoperability approach.

Building resilient cities is vital to reduce the effects of post-earthquake psychological trauma and strengthen the mental well-being of individuals. Sustainable urbanization is an important responsibility of local governments. Governments, in cooperation with local governments, should implement safe and sustainable urbanization policies in earthquake-prone areas (Yaman, Arslan, and Önalp, 2015:55). These policies should accelerate urban transformation projects and provide incentives to retrofit existing structures. According to the United Nations Development Program (UNDP, 2017), the resilience of cities to environmental and social crises is a critical element for sustainable living in the long term.

In addition to the importance of a resilient city, it is extremely important for the community living there to form resilient communities in case of a natural disaster. Resilient communities refer to communities that are less affected by earthquake risks through the measures they take and have the capacity to respond after an earthquake. Instead of being "passive communities waiting to be managed from above", these communities should be participatory and self-entrepreneurial at the local level. When considering risk management, it is important to consider and involve not only central and local governments but also all other actors living in cities. The interaction between these actors shapes the production of urban space and reveals the need to analyze the dynamics of the social production of space in the formation of a resilient urban space (Dursun and Bozcuk, 2024: 372).

These results and recommendations provide important information for future studies and practices on earthquake psychology and social preparedness. Steps should be taken in light of these findings to reduce the psychological effects of earthquakes on individuals and increase the earthquake awareness of the society.

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