

Post-Earthquake Healthcare Challenges: Access to Medications in Affected Provinces

Deprem Sonrası Sağlık Hizmetlerinde Karşılaşılan Zorluklar: Etkilenen Bölgelerde İlaça Erişim

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ABSTRACT

Aim: The February 6, 2023 earthquakes severely disrupted healthcare services, limiting access to medications and mental health support in Turkey. This study aims to examine these challenges.

Method: A cross-sectional online survey assessed 282 participants from the 10 most affected provinces between November 2023 and February 2024. Data included socio-demographics, medication access difficulties, and mental health conditions. Descriptive analyses were conducted using SPSS-23.

Results: Most participants were women (73.8%) and aged 18-25 (72.0%). Significant issues included difficulty accessing pharmacies (30.5%) and essential medications for diabetes (21.7%), hypertension (17.4%), and pain relief (4.3%). Shortages of sanitary pads (63.3%) and hygiene products (16.7%) were noted. Stress increased in 74.8%, with 57.5% reporting poorer sleep; 16.3% sought psychological support.

Conclusion: The study highlights disruptions in medication access. Findings emphasize the need for comprehensive disaster response plans to ensure continuity of essential healthcare services, particularly for individuals with chronic conditions.

Keywords: earthquake, healthcare access, mental health, disaster preparedness

ÖZ

Amaç: 6 Şubat 2023 depremleri Türkiye’de sağlık hizmetlerini ciddi şekilde aksatarak ilaç ve ruh sağlığı desteğine erişimi kısıtlamıştır. Bu çalışmada söz konusu zorlukların incelenmesi amaçlanmaktadır. **Yöntem:** Bu kesitsel çalışmada, depremden etkilenen 10 ilden toplam 282 katılımcıya Kasım 2023-Şubat 2024 arasında çevrimiçi anket uygulanmıştır. Katılımcıların sosyo-demografik özellikleri, ilaca erişim zorlukları ve ruh sağlığı durumları incelenmiştir. Tanımlayıcı analizler SPSS-23 programıyla yapılmıştır.

Bulgular: Katılımcıların %73,8’i kadın, %72,0’si 18-25 yaş aralığındaydı. Eczanelere erişimde (%30,5) ve başta diyabet (%21,7), hipertansiyon (%17,4) ve ağrı tedavisi (%4,3) için gerekli ilaçlara erişimde zorluklar yaşandığı belirlendi. Hijyenik ped (%63,3) ve kişisel temizlik ürünleri (%16,7) gibi sağlık malzemelerine erişimde de güçlükler yaşandığı saptandı. Katılımcıların %74,8’i stres seviyesinin arttığını, %57,5’i uyku kalitesinin düştüğünü bildirdi. Katılımcıların %16,3’ünün psikolojik destek aldığı belirlendi.

Sonuç: Çalışma, afet sonrası ilaç erişiminde aksaklıklar olduğunu ortaya koymaktadır. Bulgular, özellikle kronik hastalıkları olan bireyler için sağlık hizmetlerinin sürekliliğini sağlamak amacıyla afet müdahale planlarına duyulan ihtiyacı vurgulamaktadır.

Anahtar Kelimeler: deprem, sağlık hizmetlerine erişim, ruh sağlığı, afetlere hazırlık

INTRODUCTION

The February 6, 2023 earthquakes in Turkey, which affected approximately 26 million people, posed a significant challenge to the healthcare system, disrupting access to essential medicines and services. According to the World Health Organization report, at least 15 hospitals sustained partial or severe damage, severely compromising healthcare infrastructure and heightening the risk of infections and chronic diseases. Studies

have shown that during disasters, the healthcare system can be severely compromised, affecting the timely delivery of medical supplies and services. This disruption is particularly impactful for individuals with chronic conditions who rely on regular medication (1-3). As observed in previous earthquakes in Turkey, such as the 1999 İzmit earthquake, residing in temporary settlements following devastating seismic events can contribute to the emergence and persistence of infectious diseases, including Hepatitis A and E, as well as diarrheal diseases and skin infections (4). In addition, there has been an urgent and growing need for mental health and psychosocial support services, as well as continued access to sexual, reproductive, and maternal healthcare,

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antenatal care, child health services, and support for individuals with disabilities (1).

In the aftermath of the February 6, 2023, earthquakes, healthcare systems faced immense strain, with emergency departments overwhelmed due to secondary health impacts such as disruptions in access to medical supplies (1,4). A study assessing hospital admissions found that many patients required urgent medical treatment for these reasons, underscoring the critical need for effective disaster preparedness and response strategies (5). Additionally, the destruction of healthcare infrastructure, including pharmacies, further exacerbated the crisis. According to the Turkish Pharmacists' Association, over 100 pharmacies were completely destroyed or rendered inoperable due to structural damage (6). In response, the Association rapidly mobilized mobile pharmacies across the affected regions to ensure that essential medications remained accessible. These mobile units played a crucial role in mitigating immediate health impacts by providing pharmaceuticals and healthcare products to those in need (6). This initiative highlights the importance of adaptive strategies in maintaining healthcare delivery during emergencies, showcasing the resilience and responsiveness of the Turkish healthcare system in the face of unprecedented challenges (7).

The psychological impact of natural disasters is a significant concern, as trauma often leads to heightened anxiety, stress, and other mental health challenges (8-10). Research shows that in the aftermath of such events, there is a notable increase in the need for psychological support, with antidepressant use rising accordingly (11). Additionally, some individuals turn to herbal relaxation supplements as a way to manage stress during difficult times (12). Turkey has encountered similar mental health struggles following major earthquakes. For example, a study conducted after the 1999 earthquake found that 39% of survivors in prefabricated housing experienced symptoms of post-traumatic stress disorder (PTSD), while 18% showed signs of major depression. These statistics emphasize the lasting psychological effects of large-scale disasters and reinforce the

importance of long-term mental health initiatives to aid survivors.

This study aims to evaluate the challenges in accessing medications and mental health services following the February 6, 2023, earthquakes in Turkey. It examines disruptions in the pharmaceutical supply chain, damage to pharmacies, and the role of mobile healthcare services. By comparing these challenges with past earthquakes in Turkey, such as the 1999 Marmara and 2011 Van earthquakes, the study seeks to identify recurring issues and potential improvements. The findings will contribute to disaster preparedness strategies to enhance healthcare accessibility in future crises.

MATERIALS AND METHODS

Data Collection

Data for this study were collected via an online survey created using Google Forms. The survey was conducted over a four-month period, from November 2023 to February 2024, and included 282 participants residing in the 10 provinces (Hatay, Osmaniye, Adana, Kahramanmaraş, Malatya, Gaziantep, Şanlıurfa, Kilis, Adıyaman and Diyarbakır) significantly affected by the February 6 earthquakes. Participation in the survey was voluntary, and no identifying information was collected from the participants. Only those participants who accepted the informed voluntary consent form were included in the study. This study received approval from the Acıbadem University Medical Research Ethics Committee (Decision No: 2023-17/594).

Socio-Demographic Data and Survey Form

The first part of the survey collected socio-demographic data, including participants' gender, age, profession, education level, city of residence, household composition, experience of the earthquake, involvement in voluntary aid activities, presence of injured or deceased relatives, and preferred channels for obtaining earthquake-related information. The questionnaire also gathered information on participants' anxiety and stress levels, sleep quality and duration,

need for psychological support, and usage of antidepressants, herbal relaxation supplements/tea, and sleeping pills, both before and after the earthquake. The second part of the survey focused on the use of antidepressants and herbal relaxation supplements. It examined whether participants needed these substances after the earthquake, how they obtained them, and who recommended their use. Additionally, the survey investigated participants' access to prescribed medications and healthcare products, and whether they experienced any difficulties accessing pharmacies and essential drugs. In the survey, we asked participants about their access to two separate groups of medications: medications they use regularly to manage chronic conditions (non-life-threatening) and medications that require emergency access and could be life-threatening if not taken, such as insulin.

Inclusion and Exclusion Criteria

Participants residing in the 10 provinces affected by the February 6 earthquakes were included in this survey. The inclusion criteria for the study were being over 18 years of age and accepting the informed consent form.

Statistical Analyzes

Data were analyzed using the SPSS-23 statistical program (SPSS INC., Chicago, IL, USA). Descriptive statistical analyses are presented as percentages (%), numbers (n), and standard deviations.

RESULTS

A total of 282 individuals from the earthquake zone participated in the survey. The majority of the participants were female, accounting for 73.8% (n=208). Participants predominantly fell within the age range of 18-25, representing 72.0% (n=203) of the study population. In terms of occupation, 66.0% (n=186) were students, 9.6% (n=27) were teachers or academics, and 16.0% (n=45) were healthcare workers (Table 1).

Table 1. Gender, age and profession distribution of the participants (10 provinces affected by the earthquake*, 2023).

		n	%
Gender	Male	74	26.2
	Female	208	73.8
Age group	18 – 25	203	72.0
	26 – 35	38	13.5
	36 – 45	20	7.1
	46 – 60	17	6.0
	≥ 61	4	1.4
Profession	Student	186	66.0
	Teacher/Academics	27	9.6
	Healthcare workers	45	16.0
	Other	24	8.5
Total		282	100.0

*, Hatay, Osmaniye, Adana, Kahramanmaraş, Malatya, Gaziantep, Şanlıurfa, Kilis, Adıyaman and Diyarbakır

A significant portion of the participants, 85.5% (n=241), had graduated from high school or university, while 12.8% (n=36) held a master's or PhD degree. The vast majority, 96.5% (n=272), reported feeling the earthquake. Among the participants, 31.2% (n=88) indicated that a family member or relative was injured in the earthquake, and 32.3% (n=91) reported having a relative who died in the earthquake. Additionally, 40.8% (n=115) of the participants engaged in voluntary aid activities in one or more of the affected provinces.

Regarding sources of information, 35.8% (n=101) of the participants stated that they kept up-to-date with information about the earthquake through TV, the internet, and social media simultaneously. Meanwhile, 46.8% (n=132) relied on both the internet and social media, and 11.0% (n=31) followed information solely via TV.

Changing of general habits after the earthquake

After the earthquake, 61.7% (n=174) of individuals in the earthquake zone reported an increase in anxiety levels. Additionally, 74.8% (n=211) stated that they felt their stress levels

increased. A decrease in sleep quality was reported by 57.5% (n=162) of the participants, and 51.1% (n=144) noted a reduction in their sleep duration. Furthermore, 4.3% (n=12) of the participants indicated an increase in their use of antidepressants. The use of relaxation supplements increased among 15.6% (n=44) of the participants, and 6.0% (n=17) reported an increase in their use of sleeping pills (Figure 1).

Access to Medicine

Participants reported that 30.5% encountered difficulties accessing pharmacies, which was primarily due to transportation issues and the

destruction of local infrastructure. Those who regularly used medications, particularly for chronic conditions like diabetes and hypertension, were among the most affected. Regarding access to pharmacies, 68.8% (n=194) of participants in the earthquake zone reported no issues, while 30.5% (n=86) encountered difficulties. Additionally, 8.0% (n=23) stated they trouble accessing regularly used medications, whereas 90.4% (n=255) did not experience such difficulties (Table 2). When asked about access to emergency medications post-earthquake, 6.7% (n=19) reported difficulties, while 92.9% (n=262) had no issues accessing these essential drugs (Table 2).

Figure 1. Percentage of participants reporting lifestyle changes after the earthquake (10 provinces affected by the earthquake*, 2023). *, *Hatay, Osmaniye, Adana, Kahramanmaraş, Malatya, Gaziantep, Şanlıurfa, Kilis, Adıyaman and Diyarbakır*

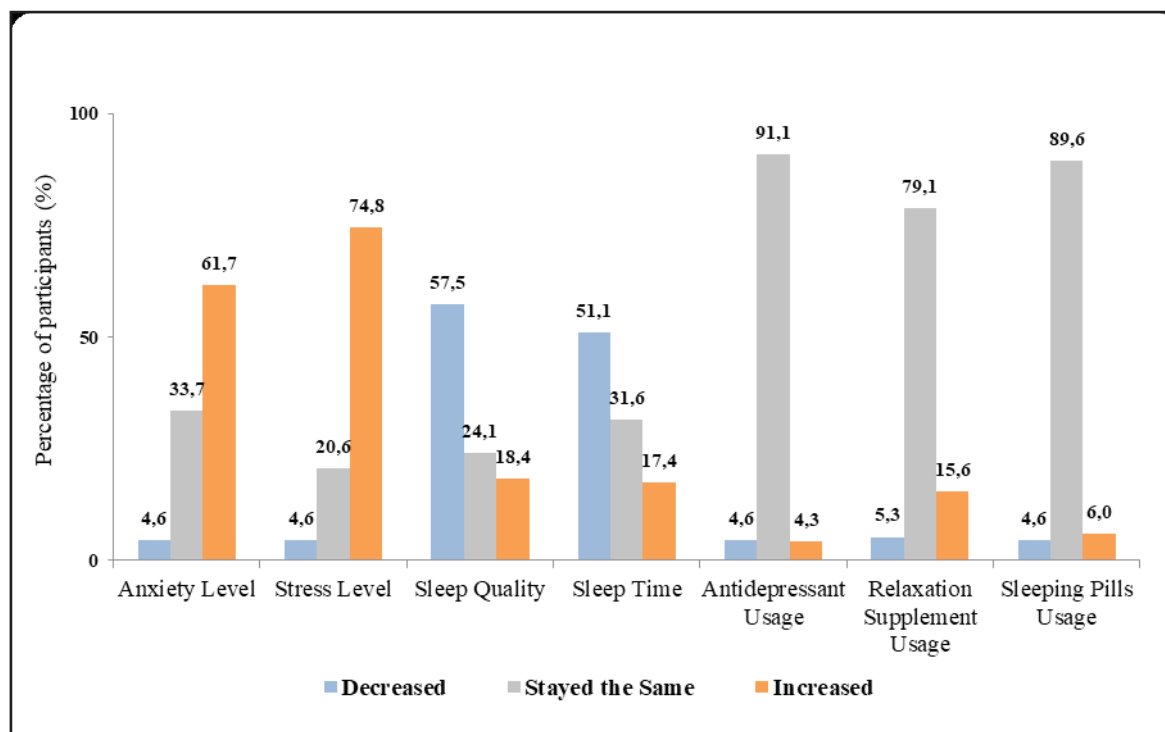


Table 2. Distribution of regularly used and emergency medications that were difficult to access after the earthquake (10 provinces affected by the earthquake*, 2023).

<i>Regularly Used Medications</i>			<i>Emergency Medications</i>		
	n	%		n	%
Diabetes Mellitus drugs	5	21.7	Diabetes Mellitus drugs	4	21.1
Antihypertensives	4	17.4	Antihypertensives	3	15.8
Analgesics	1	4.3	Analgesics	3	15.8
Antidepressants	1	4.3	Antidepressants	2	10.5
Asthma drugs	1	4.3	Asthma drugs	2	10.5
Cancer drugs	1	4.3	Other drugs with prescription	2	10.5
Warfarin	1	4.3	Cancer drugs	1	5.6
Alfuzosin	1	4.3	Warfarin	1	5.6
Carbamazepine	1	4.3	Unknown	1	5.6
Ursodeoxycholic acid	1	4.3	-		
Tranexamic acid	1	4.3	-		
Drugs with red prescription	1	4.3	-		
Unknown	4	17.4	-		
Total	23	100.0	Total	19	100.0

*, Hatay, Osmaniye, Adana, Kahramanmaraş, Malatya, Gaziantep, Şanlıurfa, Kilis, Adıyaman and Diyarbakır

n, the number of participants who reported difficulty accessing the medication

Access to Other Health Products

A total of 10.6% (n=30) of the participants reported difficulties in accessing health products, while the remaining participants did not face such issues. The health products that were most challenging to obtain after the earthquake included sanitary pads (63.3%), personal cleaning products (16.7%), first aid kits (10.0%), and diapers or diaper rash creams (10.0%).

Herbal Relaxation Supplement Usage Among Participants

Among the participants, 23.8% (n=15) reported using herbal relaxation supplements 1-3 times a day. Additionally, 50.8% (n=32) used these supplements 1-3 times a week, while 28.6% (n=18) used them 1-3 times a month. Regarding the motivation for starting herbal relaxation

supplements, 59.4% (n=38) did so based on advice from relatives or friends, 9.4% (n=6) followed a doctor's recommendation, 12.5% (n=8) were advised by a pharmacist, and another 12.5% (n=8) decided to start using the supplements on their own.

Antidepressant Usage Among Participants

Of the participants using antidepressants, 40.6% (n=13) obtained their medication from a pharmacy with a prescription after the earthquake. Meanwhile, 21.9% (n=7) received their medication from a pharmacy without a prescription, and 37.5% (n=15) had remaining tablets from a previous supply.

Psychological Counseling Needs of Participants

Regarding psychological support, 83.7% (n=236) of participants stated they did not feel the need

for psychological support. In contrast, 5.0% (n=14) received psychiatric counseling, 3.6% (n=10) received psychological support, and 0.4% (n=1) participated in online therapy. Additionally, 2.5% (n=7) indicated a need for support but did not receive it. Another 5.0% (n=14) reported receiving counseling without specifying the type of support they received.

DISCUSSION

The earthquakes that struck Turkey on February 6, 2023, severely disrupted healthcare access and profoundly affected the psychological well-being of people in the impacted areas. One of the critical findings of our study is the difficulty in obtaining medications after the disaster. Specifically, 30.5% of the respondents faced challenges reaching pharmacies, and 8.0% had trouble obtaining their regularly used medications. These statistics highlight the vulnerability of healthcare infrastructure during natural disasters and underscore the need for comprehensive disaster preparedness plans to ensure continuous access to essential medications. Similar challenges have been observed in other disasters, such as the 2010 Haiti earthquake and Hurricane Katrina, where disrupted supply chains and damaged infrastructure greatly impeded medication distribution (13,14).

In addition to the physical health challenges, the psychological impact of the earthquakes was significant. Our study found that 61.7% of participants reported increased anxiety levels, and 74.8% experienced heightened stress following the earthquakes. This surge in psychological distress is consistent with findings from other natural disasters, such as the 2004 Indian Ocean tsunami and the 1999 Marmara earthquake, where substantial increases in PTSD, depression, and anxiety were noted among survivors (14,15). The increased use of antidepressants and herbal relaxation supplements among participants further demonstrates the coping mechanisms employed during such traumatic events. These findings highlight the urgent need for mental health support and interventions in disaster preparedness and response plans to address both the immediate

and long-term psychological needs of affected populations. While the increase in antidepressant use after disasters is well-known, this study provides specific data on the February 2023 earthquake in Turkey, adding to the understanding of how these patterns manifest in this particular disaster context.

In Turkey, previous disasters such as the 1999 Marmara earthquake and the 2011 Van earthquake also resulted in significant disruptions to healthcare services, including medication access. The destruction of infrastructure and logistical obstacle severely impacted drug supply chains, leading to delays and shortages (17). The Turkish Pharmacists' Association reported that more than 100 pharmacies were either completely destroyed or rendered inoperable due to structural damage from the February 6 earthquakes, further complicating access to essential medications (6). The study revealed substantial challenges in accessing both regularly used and emergency medications. Specifically, the access to medications for chronic conditions such as diabetes, hypertension, and asthma was notably disrupted. Among the participants, 21.7% reported difficulties in accessing diabetes medications, while 17.4% faced challenges obtaining antihypertensive drugs. These figures highlight the vulnerability of individuals with chronic conditions in disaster settings, where consistent medication access is critical for managing their health. Previous studies have documented similar issues, such as the disruptions in medication access following Hurricane Katrina, which severely affected individuals dependent on chronic disease management (18). The difficulties in accessing asthma medications further emphasize the necessity for disaster preparedness plans that include specific strategies to ensure a continuous supply of essential medications during emergencies. In addition to medications, access to other healthcare products was also significantly impacted. The study found that 10.6% of participants reported difficulties in obtaining essential health products such as sanitary pads and diapers. The high demand and limited supply of these products post-disaster

can exacerbate the challenges faced by affected populations, particularly vulnerable groups such as women and infants. The inability to access these basic health products can lead to increased health risks and discomfort, further complicating the recovery process. These findings align with global disaster scenarios where the disruption of supply chains for essential health products has been a recurrent issue, emphasizing the need for comprehensive disaster response plans that address not only medications but also the broader spectrum of healthcare needs (19).

Our findings are consistent with global research on disaster impacts on healthcare systems and mental health. For instance, Galea et al. highlighted the necessity of robust disaster preparedness plans to mitigate these impacts (20). In our study, 83.7% of participants indicated that they did not feel the need for psychological support post-earthquake, yet a significant portion sought help: 5.0% received psychiatric counseling, 3.6% received psychological support, and 0.4% participated in online therapy. Additionally, 2.5% expressed a need for support but did not receive it. The observed increase in psychological counseling and antidepressant usage mirrors global patterns of heightened mental health service demand post-disaster. After the 2011 Great East Japan Earthquake, community mental health services played a crucial role in addressing the psychological impacts of the disaster (21). Similarly, Neria et al. documented the surge in mental health issues such as PTSD, depression, and anxiety following various disasters, underscoring the necessity for immediate and long-term mental health interventions (22). Our data highlight the critical importance of accessible mental health services in the aftermath of disasters. The increased use of antidepressants and the reliance on psychological counseling observed in our study reflect common coping mechanisms employed during such traumatic events. These findings underscore the urgent need for integrated mental health support within disaster preparedness and response plans to effectively address both the immediate and long-term psychological needs of affected populations.

This study has several limitations. The use of self-reported data may introduce bias, and the study population, while adequate, may not fully represent the broader population affected by the earthquakes. Additionally, the cross-sectional design limits the ability to draw causal inferences from the observed associations. Future research should include longitudinal studies to better understand the long-term impacts of such disasters on healthcare access and psychological well-being. This study's participant distribution is not entirely homogeneous, with a higher representation of females and health sciences students. This may limit the generalizability of the results. Future studies should include a more balanced sample to enhance applicability. Also, we focused primarily on overall accessibility challenges rather than the specific temporal dynamics of access in the early days following the disaster. However, it is important to note that even though our study does not detail the exact timing of the most severe disruptions, participants reported ongoing difficulties in accessing medications, even in the months following the earthquake. The infrastructural damage and logistical challenges persisted for an extended period, meaning that access to essential medications remained a problem well beyond the initial days of the disaster. Another limitation of this study is the lack of detailed geographic data regarding the specific provinces participants were from. As our survey categorized participants simply as being from an earthquake-affected province or not, we are unable to assess variations in healthcare access and psychological needs across different provinces. Future studies should consider incorporating province-level data to allow for a more nuanced analysis of regional differences in earthquake impact.

In conclusion, the February 6, 2023 earthquakes in Turkey highlighted significant challenges in accessing medications and mental health support among affected populations. These findings underscore the urgent need for effective disaster preparedness plans that ensure continuous access to healthcare services and support mechanisms during emergencies. Policymakers and healthcare

providers must prioritize adaptive strategies to enhance disaster resilience and mitigate the impacts on both physical and mental health.

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Conflict of interest

None.

Ethical Standards

This study received approval from the Acibadem University Medical Research Ethics Committee (Decision No: 2023-17/594).

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