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Assessment of healthcare needs on disabled earthquake survivors after the Malatya earthquake

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Abstract:

BACKGROUND: The earthquake that occurred in Turkey on February 6, 2023 is considered the biggest disaster of the century, having a major impact on 10 provinces of Turkey. This study might provide the necessary data for healthcare services planning for disabled earthquake survivors according to their needs after the Malatya earthquake.

MATERIALS AND METHOD: This mixed-patterned study was conducted in Malatya between February 17 and 20, 2023, with 30 disabled earthquake survivors. It was a mixed-methods study which involved both qualitative study using a semi-structured interview and quantitative analysis using both the Disability Status Analysis Questionnaire and the Exercise of Self-Care Agency Scale (ESCA).

RESULTS: The study determined four themes: "Accessibility to Assistive Devices," "Establishment of Special Facilities for Disabled Individuals after the Earthquake," "Suitability of Living Areas," and "Accessibility to Campgrounds and Tent Cities." The ESCA mean score of all disabled earthquake survivors was 87.47 ± 13.75 and those with multiple disabilities had lower ESCA scores ($P < .05$).

CONCLUSION: It was found that disabled earthquake survivors had difficulties in meeting their basic needs after the earthquake. It is considered vital to include disabled individuals and their families in disaster planning and to teach them about these plans.

Keywords:

Disability, disabled individuals, earthquake, healthcare, limitations

Introduction

On February 6, 2023, two earthquakes occurred in southeastern Turkey, with a magnitude of 7.7 centered in Kahramanmaraş at 04:17 a.m. and a magnitude of 7.6 centered in Elbistan at 01:24 p.m. The earthquakes affected 10 provinces, including Adıyaman, Kilis, Osmaniye, Gaziantep, Malatya, Şanlıurfa, Diyarbakır, Adana, and Hatay, where approximately 14 million people live. More than 45,000 people lost their lives, hundreds of thousands were injured, more than 830,000 buildings were destroyed, and more than 528,000 people were evacuated to other regions. These earthquakes were considered the biggest disaster of the

century globally (Ministry of Interior Disaster and Emergency Management Presidency 2023). People with disabilities are a particularly vulnerable group that faces significant difficulties during emergencies, such as natural disasters, and are often overlooked. Therefore, it is essential to make arrangements for their needs during and after disasters.^[1] Natural disasters are the reason for 86% of all disaster-induced deaths in the world, while 75% of such deaths occurred in Asia.^[2]

The World Health Organization (WHO) defines disability as "a state of function and structure loss due to the absence or impairment of a body part, organ, or system resulting in limitations in performing

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normal daily activities.^[3] In Turkey, disability is defined in the Law on Persons with Disabilities No. 5378 as a situation that limits one's full and effective participation in society on an equal basis with others due to various levels of loss in physical, mental, emotional, and sensory abilities.^[4] The Centers for Disease Control defines disability as a limitation in participating in normal daily activities, such as working, socializing, receiving healthcare, and preventive services, due to impairment or dysfunction in body structure/function or mental processing, such as difficulty seeing, hearing, walking, or problem-solving.^[5] The WHO describes barriers as being more than just physical obstacles. Here is the WHO definition of barriers: "Factors in a person's environment that, through their absence or presence, limit functioning and create disability. These include aspects such as a physical environment that is not accessible, lack of relevant assistive technology (assistive, adaptive, and rehabilitative devices), negative attitudes of people toward disability, services, systems, and policies that are either nonexistent or that hinder the involvement of all people with a health condition in all areas of life."^[6]

Disability varies in the form of hearing, vision, speech and language, orthopedic and chronic illnesses, and intellectual disability. Physical disability refers to "losing physical abilities at different levels as a result of a congenital or acquired disorder in the musculoskeletal and nervous system, therefore having difficulty adapting to social life and meeting daily needs, and requiring care, rehabilitation, monitoring, education, counseling, and support services."^[7] Individuals with mobility limitations due to physical disability are basically divided into two groups: those who can walk and those who use wheelchairs. Those who can walk are further divided into three groups: those who can walk without assistance, those who can walk using a cane or crutches, and those who can walk using advanced apparatus. Wheelchair users are also divided into three groups: those who use a wheelchair and can occasionally walk, those who can use the upper part of their body, and those who cannot use their body at all and rely solely on their wheelchair.^[5] Visual impairment is the complete or partial loss of visual functions. Individuals with visual impairment are defined as those who are severely affected by the lack of stimuli they need to receive through the visual sense. Hearing impairment is defined as the partial or complete insufficiency of the hearing structures and/or processes.^[8]

Earthquakes can cause death, injury, disability, and building and infrastructure collapse, depending on their intensity.^[7] Individuals with disabilities are generally more affected and have a higher risk of death during earthquakes than healthy individuals.^[9] During earthquakes, individuals with disabilities experience

serious difficulties in protecting themselves, reaching safe areas, accessing services, and meeting basic needs. Earthquake and disability are two important factors that affect each other. The likelihood of individuals with disabilities surviving earthquakes without harm is quite low. During earthquakes, disabled individuals have difficulties and limitations, such as inability to perform the life-saving behaviors of "Drop, Cover, and Hold on," to call for help, or to move from their location. Individuals without disabilities may become disabled during the earthquake due to difficulties in escaping or surviving, such as jumping, falling, crush syndrome due to trauma or being buried under debris, and spinal cord injuries due to falling structures such as walls and columns. In this regard, it is recommended to make disaster plans that include disabled individuals.^[9]

The sensitivity of the healthcare system is a concept that needs to be addressed comprehensively, with a clear statement that "everyone has the opportunity to receive an appropriate response from the healthcare system, and no one should be disadvantaged due to their disability, gender, social status, or other factors."^[10] People with disabilities face many barriers to good health. Health disparities and secondary conditions can be the result of inaccessible healthcare facilities and equipment, lack of knowledge among health professionals about specific differences among people with disabilities, transportation difficulties, and higher poverty rates among people with disabilities.^[11]

In emergency situations during disasters, the needs of people with disabilities are usually not given priority, and preparations for disabled individuals are either inadequate or nonexistent. Therefore, disabled individuals are often very concerned about their personal safety during disasters.^[1] Current research is recommended to determine the experiences of disabled individuals related to earthquakes.^[1,9,12] This study was conducted to determine the difficulties and barriers experienced by disabled earthquake survivors, to identify their disabilities, and to determine their healthcare needs during and after the earthquake. Therefore, this study mainly aimed to obtain the necessary data to plan and provide healthcare services for disabled earthquake survivors and to help meet their needs by profiling their health status in a cross-sectional sample.

Materials and Methods

Study design and setting

This is a mixed-patterned study, including both qualitative and quantitative research methods. The study used an exploratory sequential mixed-method design and was conducted in Malatya, a province in Turkey that was greatly affected by an earthquake.

Study participants and sampling

The population of the study consisted of orthopedically, visually, and hearing-impaired earthquake survivors living in tent cities in Malatya. All earthquake survivors with disabilities included in the study had a disability before the earthquake. The sample included a total of 30 disabled earthquake survivors who met the study inclusion criteria between February 17 and 20, 2023. The disabled earthquake survivors were reached through civil society organizations (disabled associations) in Malatya. The study inclusion criteria were as follows: (1) having orthopedic, visual, or hearing impairment; (2) being able to communicate; (3) not having a psychiatric diagnosis; (4) speaking Turkish; and (5) agreeing to participate in the study voluntarily. The number of required respondents was determined by interviewing participants who met the inclusion criteria until the data were saturated, and no new topics were generated. The participants' characteristics are presented in Table 1.

Data collection tool and technique

In line with the literature, the data were collected using a Semi-Structured Interview Form, the Disability Status Analysis Questionnaire Form, and the Exercise

of Self-Care Agency Scale (ESCA).^[1,9,12] The Disability Status Analysis Questionnaire contained questions about the increase in disability status of disabled earthquake survivors, their level of earthquake education, whether their belongings hindered their movement, their ability to assume appropriate positions during earthquakes (such as drop, cover, and hold on), and the auxiliary tools they lost during the earthquake. The Semi-Structured Interview Form contained eight questions to identify the difficulties, obstacles, and needs of disabled earthquake survivors during and after earthquakes. The appropriateness of these forms was assessed by obtaining expert opinions from five faculty members who work in nursing and emergency departments. After the expert opinions were received, the necessary adjustments were made to the forms. In this direction, the final version of the semi-structured questionnaire is given below:

1. What kind of situation did you face at the time of the earthquake and how did you feel?
2. What are your needs during and after the earthquake?
3. What are the physical and environmental obstacles and difficulties you encounter during an earthquake?
4. What area did you have to live in after the earthquake? (tent, container, damaged house, etc.)

Table 1: Sociodemographic data and characteristics of disabled earthquake survivors (n=30)

Participant	Age	Gender	Education status	Marital status	Type of disability	Auxiliary tools used
K1	81	M	Primary school	Single	Hearing and physical disability	Wheelchair
K2	56	M	High school	Married	Visual disability	Walking stick
K3	19	M	High school	Single	Visual disability	Walking stick
K4	18	M	Middle school	Single	Visual disability	Walking stick
K5	43	M	High school	Married	Visual disability	Walking stick
K6	35	M	High school	Single	Visual disability	Walking stick
K7	32	M	High school	Single	Visual disability	Glasses
K8	30	M	High school	Married	Visual disability	Walking stick
K9	53	M	Primary school	Married	Visual disability	Walking stick
K10	45	M	High school	Married	Visual disability	Walking stick
K11	39	M	High school	Single	Physical disability	Wheelchair, Orthosis
K12	25	M	Primary school	Single	Physical disability	Wheelchair
K13	18	M	High school	Single	Physical disability	Unable to move without support
K14	68	M	Middle school	Married	Physical disability	Wheelchair
K15	67	F	Illiterate	Single	Physical disability	Walking stick
K16	31	M	Licence	Single	Visual disability	Glasses
K17	48	M	Primary school	Married	Physical disability	Walking stick
K18	55	M	High school	Married	Physical disability	Wheelchair, battery car
K19	46	M	Middle school	Married	Physical disability	Wheelchair, battery car
K20	43	M	Primary school	Married	Physical disability	Wheelchair
K22	18	M	Primary school	Single	Visual disability	Glasses
K22	26	M	High school	Single	Visual disability	Glasses
K23	30	M	High school	Married	Visual and hearing disability	Glasses
K24	19	M	High school	Single	Visual disability	Glasses
K25	21	M	Licence	Single	Visual disability	Glasses
K26	36	M	Literate	Single	Physical disability	Wheelchair
K27	39	F	Literate	Single	Physical disability	Wheelchair
K28	33	F	Middle school	Single	Physical disability	Wheelchair
K29	27	M	Middle school	Single	Physical disability	Wheelchair
K30	26	M	Literate	Single	Physical disability	Wheelchair

What are the difficulties you encounter in accommodation, access to showers, toilets, and transportation? There is another issue you want to add, is it?

5. What are your needs that you think have been neglected?
6. What kind of help did you receive from a relative/acquaintance/volunteer person to make your life easier?
7. Issues to be considered in line with the special needs of physically/hearing/visually impaired individuals during an earthquake, what do you think?
8. What can be done to reduce the possibility of harming people with disabilities?

The quantitative data were collected using the ESCA. This scale was developed by Kearney and Fleischer (1979) and was adapted to the Turkish community by Nahcivan (1993).^[13] This is a 35-item Likert-type scale, scoring from 0 to 4. Eight items (3, 6, 9, 13, 19, 22, 26, and 31) are negatively evaluated and scored in reverse. The total scale score ranges between 0 and 140. The Cronbach's alpha value of the scale was calculated as 0.89 by Nahcivan (1993). In this study, the Cronbach's alpha value of the scale was found to be 0.939.

The participants were informed about the identity of the researchers to who they would be talking and given information about the study (its purpose, the confidentiality of the responses, where and how the data would be kept). Participation was on a voluntary basis. The researchers had master's and doctoral degrees in nursing and had several studies in the field of qualitative research. The researchers knew and had applied semi-structured in-depth interview techniques several times before. Also, there was no relationship between the researchers and the participants. The researchers did not know the participants. In this way, interviewer bias and reflexivity were eliminated. The participants were asked for their consent to have the interviews recorded on a voice recorder. Interview questions were carried out in tents and containers, as the weather conditions were cold, with one-on-one interviews with disabled earthquake survivors. Each interview session took between 30 and 45 minutes.

The qualitative data were analyzed thematically using N-Vivo software. We analyzed transcripts using the thematic approach of Braun and Clarke.^[14] Based on this approach, the data were analyzed in six stages. Before proceeding to the six stages, the audio recordings obtained from the interviews and the observation notes kept were written down by the researcher, and 60 pages of written text were obtained. In the first stage, familiarization with the dataset was ensured by repeated reading and taking notes. In the second stage, codes

related to the data obtained from the interviews were created by following a systematic way. One of the most common ways of coding is that researchers prepare a set of code lists (suggested by current theories) and organize the entire coding process according to the ready-made codes in the list. Therefore, a codebook with a ready-made code list was not used not to deviate from the philosophy of the research. In the third stage, as a result of a detailed examination of the obtained initial codes and dataset, comprehensive potential themes were created. In the fourth stage, the themes created by the researchers and the codes embedded in the themes were reviewed to ensure that the data corresponded to the research questions. In the fifth stage, the names, scope, and explanations of the themes were checked, and a detailed analysis was made. In the last stage, the findings were reported by all researchers. The study was presented in accordance with the consolidated criteria for reporting qualitative research checklist for qualitative research.

The quantitative data were analyzed using IBM SPSS V26 program (IBM, New York, USA). Frequency (f), percentage (%), arithmetic mean (\bar{x}), and standard deviation (S) values were used in the analysis of quantitative data. The statistical significance level for the study was accepted as $P < .05$.

Ethical consideration

Ethics committee approval for the research was obtained from the Social and Human Sciences Ethics Committee of the institution to which one of the authors was affiliated (Protocol No: 2023-SBB-0100, Date: 17/02/2023 and Approval No: 4). Data collection was performed based on voluntary participation. Participants were informed about the aim of the study and the confidentiality of all data. In compliance with the requirements of research ethics, the names of the participants were not used but assigned code names.

Results

A total of 30 disabled earthquake survivors, including three females and 27 males, participated in the study. Their mean age was 37.57 ± 16.32 years, and 43.33% of them had a high-school diploma. Of them, 14 were visually impaired, 14 had physical disabilities, one had both hearing and physical disabilities, and one had both hearing and visual impairments [Table 1]. In addition, 50% of the disabled earthquake survivors reported having pain, insomnia, and fatigue after the earthquake. Only one participant reported receiving workplace training on what to do during an earthquake, 20.66% reported having necessary equipment (cane, wheelchair, electric car, glasses, etc.) with them during the earthquake, and 40.66% reported having no objects

in their homes to hinder their movements or block passageways during the earthquake. Only 13.33% of the disabled earthquake survivors reported that they could assume appropriate positions during the earthquake, and only disabled earthquake survivors were able to assume the “drop, cover, and hold on” position during the earthquake. Four disabled earthquake survivors reported losing their assistive devices during the earthquake.

The ESCA mean score of the disabled earthquake survivors was 87.47 ± 13.75 [Table 2]. There was no significant difference between their ESCA mean scores according to gender ($P > .05$). However, there was a significant difference in their ESCA mean scores according to type of disability ($P < .05$). The disabled earthquake victims with multiple disabilities had lower ESCA scores [Table 3].

From the semi-structured in-depth interviews, the researchers determined four themes: “Accessibility to Assistive Devices,” “Establishment of Special Facilities for Disabled Individuals after the Earthquake,” “Suitability of Living Areas,” and “Accessibility to Campgrounds and Tent Cities.” The phenomenological results were classified and coded into these themes, and the participants’ own expressions regarding each theme are shown below.

Accessibility to assistive devices

Disabled earthquake survivors highlighted the importance of assistive devices, which play a crucial role in enabling them to move independently. They also expressed that their inability to access these devices during the earthquake caused them to lose time; therefore, they had to rely on family members for support. Additionally, those who used electric wheelchairs reported having a significant problem after the earthquake due to the lack of electricity, preventing them from charging their devices. Below are the statements of disabled earthquake survivors regarding the accessibility of assistive devices, in their own words:

Table 2: ESCA mean scores of disabled earthquake survivors (n=30)

Variable	n	Min.	Max.	\bar{X}	SD
ESCA	30	54	106	87.47	13.75

Table 3: Comparison of the ESCA mean scores of disabled earthquake survivors by some variables (n=30)

Variables	n	Min.	Max.	\bar{X}	SD	P
Gender						
Female	3	63	82	74.33	10.01	0.08
Male	27	54	106	88.93	13.46	
Type of disability						
Visually disability	14	54	106	93.14	15.03	0.04
Physical disability	14	63	99	84.07	10.32	
Multiple disability (Hearing and physical disability and visually and hearing disability)	2	67	76	71.5	6.36	

K20-Physically Disabled: *“I didn’t want to be disabled either. Of course, if I didn’t have a disability during the earthquake, I would have run out of my house on my feet. I had to get on a wheelchair due to my disability. Everything (earthquakes) had already happened until I put on my shoes. My brother took me out of the house and supported me. That’s how I managed to survive.”*

K19-Physically Disabled: *“We couldn’t understand what was happening much during the first earthquake; it was dark at night, and we barely managed to get out of the house. After all, getting on the wheelchair and saving myself was quite difficult. So, I was one of the lucky ones. My house was on the first floor, and it was a flat surface, so I was able to get out of the house, but there were lots of people who were living on the third or fifth floors or had more severe disabilities. I’m sure their families left them and ran away during the earthquake. Let me tell you, I just took the clothes I had with me, I came out with my sweatpants, I didn’t even wear shoes because I am paralyzed, and so I didn’t have that luxury; it was difficult to access wheelchairs. After the earthquake stopped, I could finally get out of the house. I started worrying about my family members rather than my own as they had to survive and take care of me.” “I needed someone to get out of the house, and I felt bad. I said to myself, if someone would die, I prayed to Allah; let me be the only one to die, let my family save themselves. I told my family this way, we experienced this disaster severely.” “We had problems due to power outages because of my electric wheelchairs. Our chance to charge my wheelchairs was zero after the earthquake. I needed to go from one place to another, but I didn’t have a battery. Manual wheelchairs can only go so far. I tried to charge my wheelchair in places with electricity and used our power more economically. Otherwise, I had no other choice.”*

K18-Physically Disabled: *“At that moment (earthquake), my wife and daughter were waiting for me. They brought the wheelchair to me. After getting dressed, I sat in the wheelchair. We were living on the ground floor, so it was easy for us to get out of the house. But the weather was very cold, and it was snowing.”*

K15-Physically Disabled: *“I had two crutches; I took one but couldn’t take the other. That’s why I struggled during and after the earthquake.”*

K11-Physically Disabled: *“My orthotic device got trapped under the rubble, and my shoe attached to it got trapped too. Right now, I don’t have my orthotic device. I have a hard time walking without it. I am 39 years old, and I have been using an orthotic device for 30 years since I was 6 years old. As I don’t have my orthotic device, I have a lot of difficulty. I really struggle both physically and mentally.”*

K8-Visually Impaired: *“I needed glasses, so I searched for my glasses and found them. I couldn’t get them the first time because my vision was a bit blurry. Later, when I got home, I immediately took my glasses. I also took my eye vitamins.”*

Establishment of special facilities for disabled individuals after the earthquake

The participants reported that they had mobility issues, needed assistive devices, and required assistance from their loved ones to evacuate buildings. They expressed that the tents were not delivered early after the earthquake and that the living spaces of the disabled individuals in the tents were limited. They also mentioned the need for ramps and tactile surfaces to access the restroom with a wheelchair, and the lack of tactile pathways after the earthquake caused mobility issues for visually impaired individuals when traveling/walking alone. Many disabled individuals emphasized the importance of creating a special center or gathering place for themselves. Below are the statements of disabled earthquake survivors regarding the creation of special facilities for disabled individuals after the earthquake:

K23-Visually Impaired: *“Something like a disabled center, like the same type of camp training centers, could be established.”*

K17-Physically Disabled: *“I would have liked to receive special attention for shelter and protection.” “We could have been taken to a different area, to more special places. Those things didn’t happen. I have to stand in line for food for 2 hours, and that of course puts me in a difficult situation.”*

K8-Visually Impaired: *“Because we are special individuals with disabilities, it would be helpful if there were gathering centers or places like that to bring us together after the disaster, to support us in the short term.”*

Access to health services

The damage and collapse of hospitals in the earthquakes and the injury and loss of life of healthcare workers in hospitals in the earthquake zones due to being trapped under rubbles result in a greater need for medical support and healthcare personnel in disasters due to the patient density in healthcare tents depending on the use of healthcare services by all earthquake victims. Disabled earthquake survivors faced several barriers accessing to

medication or healthcare services. In this context, many disabled earthquake survivors expressed the emotional traumatic effects of the earthquake verbally and stated their need for psychosocial support. In this study, many disabled earthquake survivors reported that they were unable to overcome the emotionally traumatic effects of the earthquake and needed psychosocial support. In addition, the fear of contracting a psychological illness negatively affected earthquake survivors with disabilities. Below are their own statements regarding access to healthcare services and psychosocial support for disabled earthquake survivors:

K19-Physically Disabled: *“.after 3 days, there should definitely be access to medical materials and doctors. Our clothing problems were somehow resolved, and we have reached food and clothing aids, but we experienced and are still continuing to have significant medical problems. Because, as I said, we cannot reach certain medical products and health services.”*

K8-Visually Impaired: *“.because the medication arrived quite late, there was quite a problem in that regard.”*

K17-Physically Disabled: *“Everyone is using the same toilet, we don’t know how it is being cleaned. We are also very afraid of getting sick. We haven’t been able to take a shower yet. Several people took showers, but they got sick too. The weather is very cold, and when we stay in the tent, getting sick is inevitable. We can’t access medications either, I don’t know what we will do.”*

Access to self-care and hygiene products

In emergency situations, communal use of toilets and bathrooms can cause hygiene problems. Access to hygiene products, including adult diapers, is very important for physically disabled earthquake survivors. These individuals also require hygiene products such as shaving, toiletries, and bathroom facilities. Below are some statements from physically disabled earthquake survivors about their access to personal care and hygiene products:

K18-Physically Disabled: *“I couldn’t go to the toilet, so I asked for adult diapers. They gave me only four adult diapers.”*

K16-Visually Impaired: *“We stayed in a tent and sometimes went in and out of the house for our needs. I took a shower, but the water was very dirty. My beard grew and bothered me a lot. We were staying in the same place with four families. How good can one have hygiene in such a crowded place?”*

K16-Visually Impaired: *“I couldn’t take it anymore on the seventh day of earthquake, because I’m a bit sensitive about this issue and I was in a really bad state, feeling uncomfortable because I couldn’t shave. I said I would take a shower and went*

into the house. I took a shower, but the water really didn't satisfy me. Because it was very dirty."

K12-Physically Disabled: "I couldn't take a shower. My parents only washed my head. We couldn't bathe or use the toilet."

K6-Visually Impaired: "... the water ran muddy for a while. We had trouble showering for a week and couldn't access the shower."

K30-Physically Disabled: "I usually need adult diapers. I can't find them easily now."

K15-Physically Disabled: "There was a sink and a shower for common use, but we couldn't use them. The shower was problematic. The water was already running muddy and red."

K17-Physically Disabled: "We still haven't been able to shower since the earthquake. This is a huge problem for us."

Suitability of living areas

Disabled earthquake survivors reported that due to physical mobility issues and the use of assistive devices, they needed help from someone to evacuate their homes during the earthquake. They expressed a need for appropriate physical conditions to be able to evacuate their homes in case of emergency and disaster situations. They mentioned serious difficulties in evacuating wheelchair users from upper floors due to the lack of electricity, the collapse of stair railings, and their mobility issues during the earthquake. Additionally, many disabled earthquake survivors expressed reluctance to evacuate their homes due to their difficulty in moving and inability to navigate stairs. They also noted that the earthquake worsened the situation for disabled individuals and their families as their disability hindered or slowed down the evacuation process for both themselves and their family members. Below are statements from disabled earthquake survivors regarding the suitability of their living spaces for individuals with disabilities.

K23-Visually Impaired: "It was a risk not only for us but for everyone that there were no railings on the stairs. In the second earthquake, I jumped from the balcony so as not to waste time. Something could have happened to me, my arm or leg could have been broken."

K22-Visually Impaired: "I was able to leave during the earthquake with the support of my family since I didn't live alone."

K20-Physically Disabled: "We woke up the children. I said, 'You go first, I can't go anyway because I can't walk.' They left the house, and I stayed inside. The electricity was already

cut off and the elevator wasn't working, so I couldn't get out of the house with my wheelchair in any other way. Because the elevator was not working, I had to stay at home. After the earthquake stopped, my brother came and took me downstairs."

K8-Visually Impaired: "The corners of the bed were an obstacle to me, and I had a little trouble opening the door. We need to remove obstacles in the room and protect ourselves. We were able to leave without falling."

K4-Visually Impaired: "We were able to leave hardly through the door due to panic."

K9-Visually Impaired: "There should be no obstacles in our living space. During the earthquake, when objects fall, we have difficulty moving."

Accessibility to campgrounds and tent cities

Many participants drew attention to housing problems such as tent and container shortages after the earthquake. They stated that they were only able to reach tents 3-4 days after the earthquake. They also emphasized that physically disabled individuals were having difficulty moving comfortably in the tents and experiencing physical difficulties. Disabled earthquake survivors expressed that containers would be more comfortable for them than tents. Below are the statements of disabled earthquake survivors regarding the accessibility of campgrounds and tent cities:

K17-Physically Disabled: "I am in a very difficult situation physically in the tent. I think I could move more comfortably if there was a container."

K9-Visually Impaired: "Tents, containers, and similar materials should have been delivered to us earlier. I have a visual impairment so I cannot see and go to places easily without someone's help, I cannot wait in line for food."

K7-Visually Impaired: "We were outside after the earthquake. We needed shelter because it was cold and it was night-time. We had a lot of trouble in the first 2 days. We couldn't find anything to eat, drink, or anything."

K25-Visually Impaired: "Until last night, which means we spent 13 nights in the car. We struggled a lot for the tent, so we could take a tent from the muhtar (local representative) only 13 nights after the earthquake."

Eligibility of tents

The most important point in accommodating people with disabilities is creating suitable living places. Earthquake survivors stated that the tents were very cold on cold winter days. In addition, the crowded tents also eliminated privacy. Again, disabled earthquake survivors needed someone from their family members for

transportation because the toilets and washbasins were too far from the tent places. Many disabled earthquake survivors stated that the internal characteristics of shelters should be easily accessible and suitable for their needs. They mentioned the problems they faced due to the tents being crowded and difficult to move around in. Below are the statements from disabled earthquake survivors regarding the suitability of tents for them:

K16-Visually Impaired: *"There are already four households living in our tent."*

K17-Physically Disabled: *"Tents are not suitable livable places for us, especially in this winter season."*

K29-Physically Disabled: *"I told the commander after the earthquake that we got a tent only on the 12th day of the earthquake. But the bathroom is far away, and I have difficulty getting there."*

K30-Physically Disabled: *"About nine families lived in a small tent for about a week. We applied for a tent, and it arrived a week later. Now there are three families here, and the tents are crowded."*

Relief of basic needs

After the earthquake, there is a need for bathrooms and toilets adapted for people with disabilities. The lack of these facilities in tent and container cities has created serious problems for people with disabilities after the earthquake. People with disabilities face serious difficulties in meeting personal basic needs such as eating, dressing, going to the toilet, and taking a bath. Waiting in line for food, transportation problems when they need assistance, toilets and bathrooms being far from the tent cities, the lack of tactile surfaces for visually impaired individuals, as well as the lack of sufficient space for wheelchair users to enter and maneuver, and the absence of handles for individuals using canes or crutches, all lead to various problems, such as needing assistance to dress. The importance of toilets and bathrooms being adapted for people with disabilities should be emphasized. Below are some statements from disabled earthquake survivors about meeting their basic needs:

K27-Physically Disabled: *"On the first day, I was outside, so I was forcing myself for holding my urine."*

K26-Physically Disabled: *"Toilet and bathroom needs are important for us. There should be disabled toilets, not just squat toilets." "I can't eat or stand up by myself. My mother and brother take care of these needs for me. If something happened to them during the earthquake, what would I do?"*

K18-Physically Disabled: *"I asked for a diaper because I have trouble going to the toilet, and I can't do it by myself. They said*

the mall's toilet was open and took me to the disabled toilet. The disabled toilet was very narrow. I couldn't move from my wheelchair to the toilet because the space was too tight. My daughter helped me the first time, but I couldn't go to the toilet again because I couldn't get up. I couldn't get back to my wheelchair because the space was too narrow. They said it was a disabled toilet, but it should be wider."

K16-Visually Impaired: *"Even if we had trillions of dollars now, it wouldn't mean anything to us. All we needed that day was water and basic food."*

K11-Physically Disabled: *"I couldn't find shoes for days, but a police officer gave me money from his own pocket and went outside to find me shoes. He might not even be from here. He's a stranger to me."*

K7-Visually Impaired: *"We couldn't go into the houses, so we had a lot of trouble with bathrooms and toilets. There was nothing we could do."*

Weather challenges

As the earthquake occurred in the winter season, the weather conditions were cold and snowy, affecting all individuals including disabled earthquake survivors. Disabled individuals were particularly affected by the weather conditions due to the sensory losses they experienced, especially those with physical disabilities. Due to the earthquake on a cold and rainy day, disabled individuals had to leave their basic needs such as clothes, socks, and shoes at home. It has been determined that those who have a car have a very difficult time due to the fact that these needs cannot be met immediately, while those who do not have a car are warmed by a fire. Below are statements from disabled earthquake survivors regarding the difficulties they faced due to the weather conditions during and after the earthquake:

K18-Physically Disabled: *"As I have a muscle disease, the cold weather affects me even more."*

K12-Physically Disabled: *"When we got out of the house, the weather was very cold. It was snowing, and we were very cold. We were in a desperate situation."*

K11-Physically Disabled: *".there was snowfall outside, it was around -10 degrees. I had a hard time that night, I struggled for 3 days."*

K15-Physically Disabled: *"After the earthquake, we went down and lit a fire in the cold. It was snowing and raining at the same time."*

Discussion

Individuals with disabilities require supportive equipment and devices to maintain their lives. The

study emphasized the need for auxiliary devices such as wheelchairs, canes, glasses, hearing aids, crutches, and electric vehicles, which are crucial for disabled earthquake survivors to move independently. Similarly, physically disabled individuals in Iran have emphasized their need for supportive devices such as crutches and walkers.^[15] Disabled earthquake survivors should be supported to replace their lost supportive devices after the earthquake. Additionally, disabled earthquake survivors may have lost family members who provided care for them during the earthquake. In such cases, health mechanisms should urgently intervene to ensure the care of disabled individuals. Morris and Jones (2013)^[16] also stated that people with disabilities are often trapped and left alone for days after natural disasters due to clogged streets and public passageways. Disabled earthquake survivors mentioned issues such as home and workplace harmony, access to vehicles, having spare assistive devices, paying attention to special facilities for emergency evacuation, adaptation and accessibility of shelters, consideration of appropriate bathrooms and toilets, and transportation by others.^[15]

Disabled earthquake survivors expressed several difficulties reaching and living in tents after the earthquake. In particular, the physically disabled individuals required the support of others to access food and health services due to the lack of ramps, and the visually impaired individuals required the presence of tactile surfaces. Disabled earthquake victims experienced difficulties in accessing their medication or necessary health services due to the damage to hospitals, the collapse of health workers under the rubble, and the congestion in health services. Although it is possible for the disabled to use ladders for vertical evacuation in low-rise buildings, limited mobility, the possibility of injury, and needing a lot of assistance are some of the obstacles in this regard. Similarly, in the study by Pakjouei *et al.*,^[15] disabled individuals emphasized the need for special facilities suitable for their disabilities to maintain their lives after the earthquake. In the Iran earthquake, disabled individuals reported that they could not benefit from healthcare services.^[2] In Poland, disabled individuals were found to have difficulty accessing and receiving health services in their daily lives.^[10] Considering that disabled individuals already have difficulty accessing health services in normal times, it is unfortunately not surprising that they cannot access health services in extraordinary situations such as disasters. In addition, it is common for transportation and communication systems to collapse, professional rescue teams to be insufficiently present, limited resources not to reach those in need, and even if they do, not reach everyone in need during the acute phase after a disaster. The Sendai Framework for Disaster Risk Reduction (2015-2030), which Turkey is also a party

to, emphasizes the need to increase the resilience of disadvantaged groups and their ability to withstand and recover from disasters during the predisaster, disaster, and postdisaster periods.

In this study, many disabled earthquake survivors reported that they were unable to overcome the emotionally traumatic effects of the earthquake and needed psychosocial support. Disabled individuals in Iran also expressed the need for psychological support after an earthquake.^[13] Trauma exposure has been reported to be associated with psychological distress and particularly the development of Post Traumatic Stress (PTS).^[17] Post-traumatic stress disorder (PTSD) symptoms were also commonly observed among individuals who experienced the Wenchuan earthquake in China.^[18] Even 10 years after the Wenchuan earthquake, it was found that survivors in the most affected areas still experienced severe mental trauma.^[19] Considering that disasters cause individuals to lose their loved ones, get injured, lose their homes, belongings, memories, and ultimately their past, it is expected that they will be psychologically affected. Therefore, earthquake survivors need to be strengthened psychosocially.^[17]

Disabled earthquake survivors also face difficulties accessing self-care and hygiene products. In disasters, inadequate quality and quantity of toilets and bathrooms also bring hygiene problems. In addition, it has been reported in our study that physically disabled earthquake survivors experience various difficulties in accessing diapers and hygiene products. Similarly, in Iran, physically disabled individuals emphasized the need for toilets and bathrooms that are suitable for their disabilities, accessible, and that they can use on their own to meet their basic needs.^[15] Aryankhesal *et al.*^[1] have emphasized that safe and climate-appropriate housing environments should be provided after earthquakes, containers should be preferred instead of tents for shelter, toilets and bathrooms should be designed for disabled individuals, and housing areas should not be located far from their needs. When the important factors affecting shelters are examined, health services in the form of protection, privacy, security, psychological stability, medical support, and hygiene and pollution management are important.^[20] While the American Red Cross talks about safety, cleanliness/hygiene, respect for vulnerable people, diversity, and privacy,^[21] Bashawri *et al.* (2014)^[22] explains this through environmental aspects (environmental response, safety, and hygiene) and sociocultural aspects (cultural differences, security, and communication). Sphere proposes that every family affected by the disaster should be provided with adequate space for basic living and that local culture and lifestyle should be taken into account to meet the different needs of family members for sleep, meal preparation, and food.^[23]

Disabled earthquake survivors reported that they had to evacuate their homes with the help of others during the earthquake due to physical movement problems and the use of assistive devices. They stated that power outages, the lack of stair railings in some buildings, and particularly the difficulty of evacuating individuals using wheelchairs from upper floors caused several evacuation problems during the earthquake. In addition, most disabled individuals thought that their movement problems and inability to pass stairs also hindered the evacuation process for their family members. Similarly, after the South Korean earthquake, disabled individuals had difficulty using elevators during the earthquake, making it difficult for them to leave their homes and protect themselves.^[9] After the 2010 Haiti earthquake, rescue teams identified disabled individuals as the most vulnerable group, emphasizing that during the earthquake, disabled individuals needed much more help than other people, there were deficiencies in information and coordination, and their access to resources was limited.^[24] In another study, disabled individuals expressed that they could not leave their homes on their own during the earthquake and needed help.^[15] In the United States, disabled participants reported difficulties evacuating workplaces during earthquakes due to movement problems and architectural barriers, which often prevented them from leaving the building.^[17] Designing buildings to be suitable for disabled individuals, particularly making the entrance floors accessible for them, can facilitate the evacuation of disabled individuals during earthquakes. Additionally, it is considered to be important to fix the items on the exit route in homes, schools, and workplaces where disabled individuals are present, and if it is not possible to fix them, it is recommended to change their locations to make the exit route safe.

Many participants reported postearthquake housing problems such as lack of tents and containers, especially due to the winter cold, and difficulties in physical access and movement in tents. In this earthquake, the disabled individuals faced different problems in meeting their basic personal needs such as eating, dressing, going to the bathroom, and taking a shower. Hunt *et al.*^[24] stated that finding suitable shelter or housing was one of the biggest challenges for disabled individuals after the earthquake. In Iran, disabled individuals reported difficulties in accessing campsites, toilets, and bathrooms.^[2] In the New Zealand earthquake, there was a need for urban disaster risk reduction strategies to increase the opportunities for disabled individuals to maintain their autonomy during emergencies. Among the basic factors that increase the vulnerability of disabled individuals to earthquakes, participants reported a lack of personal earthquake preparedness and public areas that are not accessible to disabled individuals.^[25] In a study, the security needs of disabled individuals were divided into

three stages: before the earthquake (constructing durable buildings, building safe and climate-resistant shelters, making rooms safe at home and in the workplace), during the earthquake (having individual protection facilities, setting up safe areas for postearthquake bathrooms, prioritizing containers over tents, housing in a safe and environmentally-free area).^[1] Aryankhesal *et al.* (2017)^[1] recommends that disabled individuals should be positioned in suitable shelters during disasters and their security needs should be identified and included in disaster management strategies, emphasizing their safety and autonomy during disasters.

In our study, only one person reported receiving workplace training on what to do during an earthquake. In line with this finding, in a study from South Korea, participants also reported a lack of evacuation systems and disaster procedures for disabled individuals, as well as a lack of earthquake drills and training for them.^[9] A study evaluating the preparedness of visually impaired individuals for emergency situations such as earthquakes and tsunamis found that participants had a low level of preparedness for emergency response.^[26] It was emphasized that disabled individuals need much more assistance during earthquakes than other people and that there is a lack of information and coordination, as well as limited access to resources for them.^[24] Therefore, it is essential to consider the needs of disabled individuals and to make plans accordingly when planning for emergencies and disasters.

The main purpose of self-care is to fulfill all the responsibilities of the individual regarding his/her health independently. In the present study, the ESCA mean score of the participants was above the average (87.47 ± 13.75). Gür (2019) conducted a study with visually impaired individuals^[27] and Gül (2020) conducted a study with orthopedic disabled individuals;^[28] both studies found similar average self-care capacity scores to that in our study. Considering the participants' total ESCA mean scores according to disability status, the present study found lower self-care mean score for disabled earthquake survivors with multiple disabilities. Disabled individuals may have to overcome the difficulties of their physical and mental health conditions. In disabled individuals, self-care ability can be adversely affected, along with symptoms such as fatigue, muscle weakness, loss of balance, and cognitive disorder. Therefore, supporting disabled individuals with innovative products appropriate for their disabilities can make their lives easier and help them perform their self-care tasks autonomously.

Limitations and recommendation

Due to the serious damage caused by the earthquake, the researchers had difficulty reaching and staying in

other provinces affected by the earthquake, so the study was conducted in one of the provinces heavily affected by the earthquake. In addition, the limited number of female disabled earthquake survivors in the study also constituted a limitation of the research. After the acute phase of the earthquake has passed, there is a need for further research to assess the situation. It is of great importance to make disaster-risk reporting emergency plans, to include disabled people in these plans, to inform the public about these plans, to have search and rescue quickly after the earthquake, to keep accurate earthquake-related information, and to coordinate earthquake-related reports correctly.

Conclusion

This study aimed to examine the difficulties experienced by disabled earthquake survivors during and after earthquakes and to determine their healthcare needs. The study found that disabled earthquake survivors had difficulty accessing assistive devices, needed special facilities after the earthquake, resided in living spaces that were not suitable for them, and faced serious difficulties in accessing campgrounds and tent cities. In addition, the self-care ability mean score of disabled earthquake survivors was above the average. It is crucial to have emergency plans in disaster-prone areas, to include disabled individuals into these plans, to inform the public about these plans, to start search and rescue operations quickly after the earthquake, to coordinate earthquake-related efforts properly, and to provide disabled individuals with basic needs such as food, clothing, shelter, and heating immediately after the earthquake. Health screenings of disabled individuals should be conducted in health tents set up in earthquake areas after the acute phase ends. Disabled earthquake survivors should be placed in containers as soon as possible after they are temporarily sheltered in tent cities established after the earthquake, so that the difficulties they experienced can be alleviated. In this regard, it is considered that educational programs, simulation applications, and public service announcements about earthquakes and other disasters should be conducted to raise awareness among disabled individuals, their families, and the entire community.

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Conflicts of interest

There are no conflicts of interest.

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