



# What are the Dimensions of “Disasters Are not Natural” Approach in the Context of Iran? Implications for the Health System

Sanaz Sohrabizadeh<sup>1\*</sup>, Azadeh Tahernejad<sup>2</sup>, Mohammad Palesh<sup>3</sup> and Masumeh Kamaledini<sup>4</sup>

1. Air Quality and Climate Change Research Center, Research Institute for Health Sciences and Environment, Shahid Beheshti University of Medical Sciences, Tehran, Iran

2. Department of Management Sciences and Health Economics, School of Health, Mashhad University of Medical Sciences, Mashhad, Iran

3. Department of Health in Disasters and Emergencies, School of Public Health and Safety, Shahid Beheshti University of Medical Sciences, Tehran, Iran

4. Department of Social Sciences, Faculty of Social Sciences, Communication and Media, Central Tehran Branch, Islamic Azad University, Tehran, Iran

## Abstract

**Background:** Using the adjective “natural” with “disaster” can result in neglecting human-made vulnerabilities. In Iran, applying the “natural disaster” term is almost common in all disaster management settings. The present study is aimed to explore the aspects/dimensions of the “disasters are not natural” approach in the context of Iran and then suggest implications for the health system in regard to the findings.

**Methods:** The current research is a qualitative study utilizing conventional content analysis. 19 participants were purposively selected, and data were gathered through in-depth semi-structured interviews. Data analysis occurred concurrently with data collection, following the content analysis method outlined by Graneheim and Lundman.

**Results:** Human roles and interventions theme, as well as five categories and 16 subcategories, were extracted from data. The categories include environmental degradation (e.g., deforestation/desertification), economic vulnerability (e.g., poverty and economic difficulties), political/governance vulnerability (e.g., reactive approach to disasters), socio-cultural barriers (e.g., religious beliefs), and vulnerability of disaster management infrastructure (e.g., insufficient educational resources and programs).

**Conclusion:** This study highlights the human roles in disasters and the critical need for re-consideration of applying the “natural disasters” term. Using “disasters” instead of “natural disasters” can be facilitated through the increase in community-based programs and interventions such as education and training, public awareness, and exercises.

**Keywords:** Disasters, Health system, Iran, Natural hazards

## \* Corresponding author

**Sanaz Sohrabizadeh, PhD**

Air Quality and Climate Change Research Center, Research Institute for Health Sciences and Environment, Shahid Beheshti University of Medical Sciences, Tehran, Iran

**Tel:** +98 21 2243 2040 (208)

**Email:**

ssohrabizadeh@gmail.com,  
sohrabizadeh@sbmu.ac.ir

**Received:** 10 Jun 2025

**Accepted:** 24 Jul 2025

## Citation to this article

Sohrabizadeh S, Tahernejad A, Palesh M, Kamaledini M. What are the Dimensions of “Disasters Are not Natural” Approach in the Context of Iran? Implications for the Health System. *J Iran Med Council*. 2026;9(1):103-18.

## Introduction

The occurrence of disasters is rising across the world. Disasters have killed millions of people and caused injuries, traumas, loss of livelihoods, and displacement over the last decades (1). Disasters attributed to natural hazards caused 15,028 deaths, affected approximately 100 million people, and imposed almost 190 billion US\$ in economic losses globally in 2020 (2). The most important question is, what if the disasters are not natural, and all negative effects and destruction of disasters do not have to happen?

Disaster risk is defined as "potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society, or community in a specific period, determined probabilistically as a function of hazard, exposure, vulnerability, and capacity" (3). Thus, a disaster is the combination of hazards, vulnerabilities, and capacities, which vary in each setting. A hazard is defined as "a process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation," and natural hazards are related to natural processes and phenomena (3). Natural hazards, as Chaudhary *et al* declare, are triggers for natural disasters and are classified as geological, hydrological, meteorological, climatological, biological, and extraterrestrial hazards (4). Yet, can we claim that disasters are natural, too, just because the hazards are natural?

Vulnerability, as another component of disaster risk, is attributed to "the conditions determined by physical, social, economic, and environmental factors or processes which increase the susceptibility of an individual, a community, assets, or systems to the impacts of hazards" (3). Vulnerability is the key element directly associated with disaster severity and magnitude. On the other hand, capacity addresses all available strengths and resources within a society to reduce disaster risks and improve resilience. Considering the concepts of vulnerability and capacity, the human roles and interventions in disaster occurrence are undeniable (5).

Differences in vulnerability and capacity levels between affected countries determine the extent to which they are damaged or destroyed by disasters. For instance, although high-income and low- and

middle-income countries are subject to the same natural hazards, most of the 3.3 million deaths reported in the last 40 years occurred in poor countries. This means that the higher the level of vulnerability, the greater the number of victims. Likewise, the difference in the death toll in Haiti and the Dominican Republic, which shared the same storms and islands, revealed that disasters are not natural but man-made events (6).

## "Disasters are not natural" approach

References to 'natural' disasters imply that disasters are independent of vulnerability; however, they are not. Vulnerability is a product of political and social processes created by human beings. Poverty and injustice, unplanned urbanization, and marginalization in terms of gender, age, ethnicity, class, and religion have created vulnerable communities to disasters (7). Hence, natural hazards do not drive disasters; rather, human-made vulnerabilities do. That is, a severe earthquake, flood, or storm will not generate a disaster if it occurs far from a populated area. Ismail-Zadeh argues that floods are the Acts of God, but the damage and destruction resulting from floods are acts of human beings (8). Insufficient disaster risk reduction and prevention, inadequate investment in preparedness, and especially, early warnings, as well as community resilience and development, are considered human roles in creating disasters. Accordingly, a disaster is the consequence of our decisions, and that is why the notion that "disasters are not natural" has emerged as an approach (9).

The ways disasters are created can influence disaster risk perception in the community since they show how disasters are associated with human interventions such as urbanization, population growth, and global warming. Thus, applying the term "natural" to "disaster" suggests that human decisions and interventions do not matter due to the natural source of disasters (10). Therefore, the term "natural disaster" was mentioned as a misnomer over 40 years ago. Blaming nature for disaster destruction and placing the responsibility for the damage on the natural origin of disasters or "acts of God" are reflected in the expression "natural disasters" (11). Using the adjective "natural" with "disaster" results in neglecting human-made vulnerability and avoiding

responsibility for failures in developing capacities and resilience in regions prone to natural hazards (12). Thus, “disasters are not natural” has increasingly been recognized as a fact in the disaster risk reduction literature and frameworks. Regarding the “disasters are not natural” approach, similar terms are used as shown in table 1.

### ***The importance of the “disasters are not natural” approach in the Iranian context***

Iran is known as a highly hazard-prone country where different disasters affect people’s lives and livelihoods. The major disasters that have frequently occurred in Iran are earthquakes, floods, and droughts (13). For instance, the Rudbar-Manjil earthquake in 1990 and the Bam earthquake in 2013 killed about 35,000 and 41,000 people, respectively (14).

In Iran, the level of disaster preparedness among households was reported as 9.3 out of 100 in 2015, which is low (15). The INFORM Risk Index, as an open-source risk assessment for disasters, reported that Iran’s disaster risk in 2024 has been classified as high risk (5.4 out of 10). Iran’s risk profile shows scores of 7.3, 4.8, and 4.5 for hazard and exposure, vulnerability, and lack of coping capacities, respectively (16).

Disasters have frequently affected Iranian people and imposed health consequences and physical destruction so far. In Iran, the use of the term “natural disaster” is common in almost all disaster management publications and settings due to the culture that regards disasters as a natural consequence of a given hazard. This highlights the importance of initiating a common disaster discourse that embraces a way of thinking to detach the “natural” from the “natural disaster” phrase. The only natural component of disaster risk is

the hazard, and the differences between countries can be attributed to varying levels of their own physical and socio-economic vulnerabilities, which, in turn, depend on human-made decisions (17).

Despite the growing global attention to the misnomer of “natural disasters,” there is a significant lack of context-specific research addressing how this concept is understood and applied in countries like Iran. Furthermore, replacing the term “natural disaster” with “disaster” can help the public recognize their roles in disasters and encourage them to take steps toward preparedness and mitigation measures using lessons learned from previous disasters. Therefore, the present study aims to explore the aspects/dimensions of the “disasters are not natural” approach in the context of Iran. Since the health system can play important roles in reducing vulnerability and improving capacity in Iran, several implications based on the dimensions of the “disasters are not natural” approach have been suggested at the end.

## **Materials and Methods**

### ***Study design***

This study was conducted using a qualitative research approach with conventional content analysis (18). It adhered to the guidelines outlined in the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist. The research was performed between November 2023 and September 2024.

### ***Setting***

Iran is a country located in the Middle East, spanning approximately 1.65 million square kilometers with more than 80 million inhabitants. Iran is highly prone to natural hazards, primarily due to its geographical and climatic conditions. For instance, the country is situated on several major tectonic plates, making it susceptible to earthquakes. Additionally, populations are frequently affected by other disasters such as floods, droughts, and landslides, exacerbated by climate change and environmental degradation (19).

### ***Participants***

In this study, the participants were the experts who benefited from the enriched academic and field experiences in disaster risk reduction management. A total of 19 participants were selected using a purposive

**Table 1.** Different terminologies reflecting the “disasters are not natural” approach

|                         |                                              |
|-------------------------|----------------------------------------------|
| No natural disasters    | There is no such thing as a natural disaster |
| Disasters avoided       | Un-natural disasters                         |
| Disaster by choice      | Disasters as human made events               |
| Vulnerability by choice | Capacity by choice                           |

sampling method. Interviewing relevant experts offered a broader perspective on the research topic and allowed for different perceptions and a deeper understanding of the "No Natural Disasters" concept. The inclusion criteria for selecting the participants were to have at least a related bachelor's degree and a minimum of one year of research or educational experience in areas such as health in disasters and emergencies, crisis management, disaster sociology, seismology, drought/flood management, disaster psychology, health policy, and climate change. The exclusion criterion was a lack of interest in participating in our study. The number of participants was determined based on the principle of data saturation, which was reached after 19 interviews. The age of the participants was between 25 and 66 years, mostly between 46 and 66 years. Of all the participants, 79% were female, and the remaining were male. The educational level ranged from bachelor to PhD. Furthermore, the work experiences of the most participants were between 16 and 26 years (Table 2).

### Data collection

Data collection was carried out through in-depth semi-structured interviews. Initially, three unstructured interviews were conducted to identify the general concepts. Then, 16 semi-structured face-to-face interviews were performed using an interview guide. These interviews took place in a

quiet and comfortable environment to ensure that the participants could communicate at ease. Each interview began with open-ended questions, followed by more specific inquiries to delve deeper into the discussion. For instance, experts were asked, "Based on your perception, what does the phrase 'no natural disaster' mean?" or "What dimensions do you believe are essential to understanding the 'no natural disaster' approach?"

A well-trained member of the research team (AT) in qualitative data collection conducted the interviews. All the interviews were pre-scheduled, and the locations were selected according to the participants' preferences. The interviews were audio-taped after the participant's consent, and to ensure data accuracy, each interview was transcribed immediately afterward. All the interviews were conducted in Persian and lasted between 25 to 45 min.

### Data analysis

Data analysis was conducted concurrently with the data collection, employing the content analysis method based on the five-step approach of Graneheim and Lundman (18). First, each recorded interview was transcribed verbatim. The transcript was then carefully reviewed multiple times to identify sentences that reflected the participants' experiences, which were marked as the meaning units. These meaning units were subsequently condensed and abstracted into codes. In the next step, the codes were organized into subcategories based on their similarities and differences. Finally, similar subcategories were classified to make the main categories. This iterative five-step process was applied to all the interviews until the main categories were finalized.

Quotes which exemplify findings were presented in italics with the participant number shown in parentheses. Information that might identify the interviewee was excluded, in an effort to ensure the confidentiality.

### Trustworthiness

The trustworthiness of the study was achieved using four strategies: credibility, dependability, confirmability, and transferability (20). To ensure data credibility, the authors employed techniques such as prolonged engagement with the research

**Table 2.** Demographic characteristics of the participants

| Variables              |          | N  | %  |
|------------------------|----------|----|----|
| Gender                 | Male     | 15 | 79 |
|                        | Female   | 4  | 21 |
| Age (year)             | 25-45    | 9  | 47 |
|                        | 46-66    | 10 | 53 |
| Work experience (year) | 5-15     | 7  | 37 |
|                        | 16-26    | 10 | 53 |
|                        | > 26     | 2  | 10 |
| Educational level      | Bachelor | 1  | 5  |
|                        | Master   | 3  | 16 |
|                        | Ph.D     | 15 | 79 |

process, triangulation, peer checks, and negative case analysis (20,21). Data triangulation involves utilizing different sources and methods to improve data quality, including interviews and field observations. Peer debriefing allowed researchers to test their insights and tackle difficult questions. Negative case analysis was applied when the collected data contradicted the researcher's expectations, enhancing the study's credibility. Dependability was evaluated through an audit trail, stepwise replication, code-recode strategies, and peer review. Documentation of the study process and consideration of the researcher's background and interest in the topic were performed to achieve confirmability (20). This research ensures dependability by providing detailed information for other researchers to replicate and build upon the study. Transferability was achieved by offering a thorough description of all study phases, including design, setting, participant selection, data collection,

and analysis.

## Results

For transparency and contextual understanding, general demographic and professional characteristics of all the interview participants are presented in table 3. One theme, human roles and interventions, as well as five categories and 16 subcategories, were extracted from the research data. This theme includes the categories of environmental degradation, economic vulnerability, political/governance vulnerability, socio-cultural barriers, and vulnerability of disaster management infrastructure (Table 4). All the categories and subcategories are explained as follows:

### *Environmental degradation*

Environmental degradation, driven by human activities, was reported to be a significant factor contributing to increasing vulnerability and disasters.

**Table 3.** Characteristics of interview participants

| PID | Gender | Age range | Education level | Field of expertise                    | Work experience (Years) |
|-----|--------|-----------|-----------------|---------------------------------------|-------------------------|
| P1  | Male   | 54        | PhD             | Crisis management                     | 19                      |
| P2  | Female | 55        | PhD             | Health in disasters and emergencies   | 21                      |
| P3  | Male   | 33        | Master          | Environmental management              | 8                       |
| P4  | Male   | 36        | PhD             | Health in disasters and emergencies   | 5                       |
| P5  | Female | 60        | PhD             | Disaster sociology                    | 28                      |
| P6  | Male   | 62        | PhD             | Seismology                            | 27                      |
| P7  | Male   | 42        | PhD             | Health policy                         | 15                      |
| P8  | Male   | 58        | PhD             | Health in disasters and emergencies   | 26                      |
| P9  | Male   | 55        | PhD             | Crisis management                     | 23                      |
| P10 | Male   | 38        | Master          | Environmental health & climate change | 9                       |
| P11 | Female | 34        | Master          | Crisis management                     | 7                       |
| P12 | Male   | 59        | PhD             | Disaster economics                    | 22                      |
| P13 | Male   | 45        | PhD             | Health in disasters and emergencies   | 14                      |
| P14 | Male   | 51        | PhD             | Health in disasters and emergencies   | 16                      |
| P15 | Female | 37        | PhD             | Disaster psychology                   | 6                       |
| P16 | Male   | 25        | Bachelor        | Environmental engineering             | 5                       |
| P17 | Male   | 54        | PhD             | Health in disasters and emergencies   | 19                      |
| P18 | Male   | 56        | PhD             | Health in disasters and emergencies   | 21                      |
| P19 | Male   | 66        | PhD             | Seismology                            | 33                      |

**Table 4.** Categories, sub-categories and selected codes extracted from the interviews

| Theme                         | Categories                         | Sub-categories                                               | Selected codes                                                                                                                                                                                                                                               |
|-------------------------------|------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Human interventions and roles | Environmental degradation          | Deforestation/<br>desertification                            | <ul style="list-style-type: none"> <li>- Destruction of forest ecosystems</li> <li>- Reduction of forest plant species</li> <li>- Wide Forest fires</li> <li>- Change of forest land use</li> </ul>                                                          |
|                               |                                    | Improper waste<br>disposal                                   | <ul style="list-style-type: none"> <li>- Increasing plastic waste in urban areas</li> <li>- Lack of effective recycling systems</li> <li>- Unsanitary disposal of waste</li> </ul>                                                                           |
|                               |                                    | Greenhouse gas emission                                      | <ul style="list-style-type: none"> <li>- Dependence of power plants on diesel fuel</li> <li>- Lack of using renewable solar energy</li> <li>- Lack of using renewable wind energy</li> </ul>                                                                 |
|                               | Economic vulnerability             | Poverty and economic difficulties                            | <ul style="list-style-type: none"> <li>- Scarcity in budgeting for implementing DRR programs</li> <li>- Poverty impacts the implementation of DRR measures</li> <li>- Lack of access to adequate education for the poor</li> </ul>                           |
|                               |                                    | Improper distribution of resources                           | <ul style="list-style-type: none"> <li>- Insufficient access to resources for low-income families</li> <li>- Inequality in the distribution of public services</li> <li>- Reduced access of rural people to urban resources</li> </ul>                       |
|                               |                                    | Insufficient investment                                      | <ul style="list-style-type: none"> <li>- Insufficient funding for flood preparedness</li> <li>- Insufficient investment in transportation infrastructure</li> <li>- Insufficient private sector investment in safe construction</li> </ul>                   |
|                               | Political/governance vulnerability | Reactive approach to disasters                               | <ul style="list-style-type: none"> <li>- Insufficient pro-active disaster planning</li> <li>- Weak preparation to adequately respond to the public needs</li> <li>- Provision of resources without accurate needs assessment</li> </ul>                      |
|                               |                                    | Insufficient DRR governance                                  | <ul style="list-style-type: none"> <li>- Insufficient comprehensive disaster management policies</li> <li>- Lack of legal framework for DRR</li> <li>- Weakness in DRR monitoring</li> </ul>                                                                 |
|                               |                                    | Insufficient policies for a<br>community-based approach      | <ul style="list-style-type: none"> <li>- Insufficient attention to local needs</li> <li>- Inadequate participatory policies</li> <li>- Inadequate local training programs</li> </ul>                                                                         |
|                               |                                    | Insufficient attention to groups with<br>special needs       | <ul style="list-style-type: none"> <li>- Less access to food in disaster-prone areas</li> <li>- Failure to consider women's needs</li> <li>- Lack of access to adequate shelter for the poor</li> </ul>                                                      |
|                               | Socio-Cultural barriers            | Religious beliefs                                            | <ul style="list-style-type: none"> <li>- Adverse religious beliefs impact DRR perception</li> <li>- Community reliance on their faith</li> <li>- Role of religious leaders in disaster management education</li> </ul>                                       |
|                               |                                    | Insufficient disaster risk awareness<br>and perception       | <ul style="list-style-type: none"> <li>- Insufficient awareness about the most frequents hazards</li> <li>- Insufficient attention to disaster prevention training</li> <li>- Insufficient dissemination of correct disaster response information</li> </ul> |
|                               |                                    | Preferring individual interests over<br>collective interests | <ul style="list-style-type: none"> <li>- Individual roles in climate change</li> <li>- Hoarding of food resources</li> <li>- Hoarding of medicine</li> <li>- Failure to comply with safety protocols</li> </ul>                                              |

Contd. table 4.

|                                                     |                                                                    |                                                                                                                                                                                                                                       |
|-----------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Vulnerability of disaster management infrastructure | Insufficient educational resources and programs                    | <ul style="list-style-type: none"> <li>- Insufficient flood prevention training in schools</li> <li>- Inadequate flood prevention training in universities</li> <li>- Insufficient drought adaptation training for farmers</li> </ul> |
|                                                     | Weak infrastructure of disaster risk communication and information | <ul style="list-style-type: none"> <li>- Weak access to disaster information</li> <li>- Weakness in early warning systems</li> <li>- Problems in communication between related institutions</li> </ul>                                |
|                                                     | Weakness of management/monitoring organizations                    | <ul style="list-style-type: none"> <li>- Low transparency in decision making of related organization</li> <li>- Insufficient effective systems for establishing preventive laws</li> </ul>                                            |

Lack of community awareness regarding the negative consequences of destroying natural ecosystems can result in consequences such as degradation. Three key areas of human intervention contributing to this issue were highlighted by some interviewees: deforestation/desertification, improper waste management, and greenhouse gas emissions. “Environmental degradation not only heightens disaster risk but also undermines community resilience. Awareness and proactive measures are essential to mitigate the impacts of human activities on our ecosystems” (P17).

### **Deforestation/desertification**

According to the experiences of the participants, forests play an important role in mitigating the effects of climate change and mitigating climate related disasters, such as floods and droughts. In addition to deforestation and changing the use of forest areas, human actions were deemed to have led to damaging the forest ecosystems and the destruction of plant species and animal habitats. Trees are being cut down due to excessive consumption of wood, the development of agricultural lands into the forests, and wildfires can be examples of human interventions in this area. One interviewee exemplified this by stating: “The destruction of natural ecosystems severely affects biodiversity, as we are witnessing a decrease in plant species due to excessive harvesting, as well as deliberate fires that have destroyed wildlife habitats” (P3).

### **Improper waste disposal**

Improper waste disposal can result in environmental

degradation. The increase in waste types and lack of their separation at source, the unsanitary burial of infectious/chemical waste in the suburbs, as well as the insufficient number of recycling systems in cities and villages were referred to as examples of human actions that can increase the vulnerability to disasters. For instance, the epidemics, especially after disasters, is very likely a result of improper waste management and environmental health.

*“Unsanitary burial of waste and dumping of industrial wastewater into rivers threatens the health of the environment and society” (P14).*

### **Greenhouse gas emission**

Greenhouse gases have increased significantly as a result of human activities and have caused global warming. For instance, the use of fossil fuels and ignoring renewable energies, such as solar energy, can be mentioned. Excessive use of personal vehicles contributes to the emission of greenhouse gases and global warming in Iran. Severe droughts and floods as the destructive disasters in Iran, are the consequences of global warming. In addition, insufficient rules and authority to monitor and control the industries and sectors that produce greenhouse gases also reflect the role of humans in future disasters in Iran.

*“The dependence of our power plants on fossil fuels has severely affected air pollution and the production of toxic gases. Also, the increase in pollution caused by heavy car traffic, especially in large cities, has created serious air pollution challenges” (P7).*

### **Economic vulnerability**

Given the increasing poverty and economic

inequalities in society, disaster preparedness and risk reduction measures are not a high priority for poor people. Several interviewees argued that urban slums, construction on riverbanks or mountain slopes, and lack of financial resources are the reflections of poverty in Iran's community. In addition, unemployment and economic instability impose more pressure on people and make them vulnerable to the hazards.

"Economic vulnerability exacerbates the impact of disasters, as the poorest communities often lack the resources for effective preparedness. Addressing poverty and inequality is crucial for building resilience against hazards" (P12).

### **Poverty and economic difficulties**

Poverty plays an important role in increasing the population's exposure to disasters. Poor and low-income people allocate their limited financial resources to their basic needs rather than following preparedness and disaster risk reduction measures. Economic instability affects the unemployment rates and marginalization, intensifying people's vulnerability to disasters. For example, building non-resistant and insecure houses in hazard-prone regions, as well as inadequate access to educational resources and information on disaster risk reduction, are mostly reported in low-income and poor regions.

*"Economic instability and rising unemployment rates in vulnerable communities have a significant impact on people's ability to meet basic needs and implement disaster risk reduction programs. Also, lack of access to adequate education for the poor exacerbates these problems" (P4).*

### **Improper distribution of resources**

Inadequate access of low-income families to resources and unfair distribution of wealth in the country were mentioned as one of the key factors of vulnerability to disasters. Thus, ineffective policymaking and lack of transparency in the distribution and allocation of resources at national and local levels can be addressed. Insufficient access to welfare and health care facilities, especially in rural areas and small cities, is another example of improper distribution of resources in society. On the other hand, the post-disaster recovery in poor and marginalized communities is almost done without focusing on disaster risk reduction and

resilience measures due to the lack of resources.

*"Improper distribution of resources creates a cycle of vulnerability, where marginalized communities are left without access to essential services and support. Effective policymaking and transparency are vital to ensure equitable recovery and resilience in the face of disasters" (P5).*

### **Insufficient investment**

Interviewees raised the idea that insufficient investment in disaster risk reduction and prevention is important in worsening disaster vulnerabilities. Insufficient budget allocation for disaster preparedness measures, including planning, early warning systems, training, exercises, and relief equipment, as well as the old ineffective water, electricity, and gas infrastructures, can turn a disaster into a catastrophe. Although we know that floods, earthquakes, and droughts are the most common disasters in Iran, investments for preventing these disasters need to be considered.

*"In the field of disaster preparedness, there is a clear lack of financial resources. For example, transportation infrastructure and early warning systems require more attention and investment. Also, the lack of attention to securing buildings and renewing the air fleet has caused great losses to society" (P11).*

### **Political/governance vulnerability**

The country's policymakers and legislators play a crucial role in building capacity or exacerbating vulnerability to disasters. Policymaking focused on a reactive approach to disaster management and the lack of disaster risk governance, as well as an insufficient focus on a community-based approach, can result in vulnerability to disasters.

*"Effective governance and proactive policymaking are essential to transform vulnerability into resilience against disasters" (P1).*

### **Reactive approach to disasters**

Adopting a response-based and reactive approach to disasters leads to inadequate disaster prevention and preparedness measures, and hence the deaths of many people at the time of disasters. On the other hand, the organizations involved in the response phase suffer from a lack of coordination and duplicate work due

to the weak preparedness and reactive approach of decision-makers to disasters. In addition, the proactive approach to disasters can facilitate the resource allocation for effective disaster management and also increase the community's trust in the government's roles and interventions for disaster risk reduction. Thus, a pro-active approach to disasters encourages the lessons learnt in previous disasters to save lives and structures by not repeating the same experiences. *"In the face of disasters, our focus is more on responding to crises than preventing them. This approach may prevent society from responding quickly and effectively when an incident occurs. In addition, coordination between different institutions is crucial in such situations, but sometimes this coordination is lacking. It seems that people's trust in government institutions is also affected in these situations, which can create additional challenges"* (P2).

### **Insufficient DRR governance**

The lack of disaster risk reduction (DRR) governance in the country was mentioned as a vulnerability in the field of policy-making, legislation, and supervision. According to the experiences of participants, insufficient focus on risk reduction policies at all stages of the disaster management cycle, with inadequate legal framework for the implementation and supervision of disaster risk reduction measures, are among the most important challenges of disaster management in Iran. Insufficient training and the lack of risk reduction and mitigation culture at the government and national disaster management level, along with the lack of policy-making and planning for public awareness, can be considered other important issues in DRR governance. The lack of internal and external coordination and cooperation among disaster management organizations can reflect the DRR governance vulnerability.

*"In our country, disaster management policies and programs have not been well addressed. For this reason, different institutions are moving in different directions, and this hurts the effectiveness of crisis management. In addition, there are very few educational programs to raise awareness among the community, which is why people are not sufficiently prepared to face disasters"* (P9).

### **Lack of policies for community-based approach**

Community-based approach to disaster management and community participation in reducing vulnerability and improving capacity are other important dimensions of policymaking in this area. The inadequacy of policies related to community participation and involvement in planning, decision-making, and performing disaster management interventions was implied as a vulnerability in this area. The lack of policymaking and planning focused on the use of indigenous knowledge and community experiences for disaster risk reduction and prevention is another dimension of not considering community-based approaches to disasters. The need for community-based educational programs and the use of community initiatives for effective disaster preparedness and response needs to be evident in the country's disaster management policies.

*"If public forums are not held to discuss local risks, people may not be aware of the risks and may not be able to act well in times of crisis. Transparency in local decision-making and consideration of people's experiences can help improve the situation"* (P4).

### **Insufficient attention to groups with special needs**

Based on the participants' experiences, the current policies and programs in Iran do not meet the needs of vulnerable groups in disasters. Vulnerable groups are people with special needs, including the poor and marginalized, the elderly, children, people with disabilities, pregnant women, and people with chronic diseases. They need to be specifically considered in disaster preparedness and risk reduction plans. The examples are providing their access to shelter and other basic facilities such as clean water, food and sanitation, evacuation, relief packages, health and rehabilitation facilities.

*"In many villages, health services are not provided well during disasters, and this can lead to serious problems for vulnerable people. Since evacuation sites are not specifically designated for certain groups, these people face serious challenges during a crisis"* (P19).

### **Socio-cultural barriers**

The socio-cultural context is another important factor that can affect disaster vulnerability and capacity. Therefore, the role of social and cultural factors is prominent in the "no natural disasters" approach. The subcategories of religious beliefs, insufficient disaster risk awareness, and perception, as well as preferring individual interests over collective interests, are explained as follows:

*"Socio-cultural factors profoundly influence disaster vulnerability, as collective action and awareness are crucial for effective risk reduction" (P18).*

### **Religious beliefs**

Based on the participants' experiences, the religious beliefs of the community members influence the reduction or increase in vulnerability to disasters. Religious belief, which underestimates the role of humans in the occurrence of disasters and explains them as a punishment from God, plays an important role in denying the community responsibility for disaster prevention and mitigation. Religious interpretations of disasters by some religious leaders and their inconsistency with the importance of preparedness and mitigation measures affect the perception of disaster risk in the community. On the other hand, the impact of spiritual support provided by trained experts, as well as the role of religious beliefs in promoting DRR measures in the community, especially the rural ones, is significant. This view was articulated by one of the interviewees:

*"In times of crisis, many people rely on their faith, and this can act as a source of comfort and hope. Clergy can also play a significant role in disaster management education. Unfortunately, sometimes incorrect religious interpretations of disasters can lead to fear and confusion in the community" (P13).*

### **Lack of disaster risk awareness and perception**

Lack of DRR perception can be considered as one of the barriers to promote a proactive approach to disasters in the community. The public needs to know about their roles in reducing the damage caused by disasters through community-based education campaigns, the media, and relevant organizations. Insufficient access of the public to knowledge and information related to disaster preparedness and risk

reduction can be considered as another barrier to the public DRR perception.

*"Lack of educational campaigns and media coverage about disaster risks and preparedness contributes to a decrease in public awareness. Also, a lack of awareness of construction laws and regulations can lead to greater vulnerability to disasters. The influence of local culture on risk reduction behaviors should also not be ignored" (P10).*

Preferring individual interests over collective interests was described as one of the cultural barriers for promoting disaster risk reduction measures. The examples include neglecting the building codes and the use of qualified materials during construction, ignoring health protocols during pandemics, human actions in the increase of air pollution as well as hoarding food and medicine after disasters.

*"Lack of cooperation in evacuation or hoarding of resources can lead to greater vulnerability of the community. Also, selfish behaviors and failure to comply with protocols weaken the sense of solidarity and exacerbate the crisis" (P8).*

### **Vulnerability of disaster management infrastructure**

Disaster management infrastructures play an important role in promoting disaster prevention and risk reduction measures. Accordingly, educational resources and programs, disaster risk communication and information infrastructure, as well as management/monitoring organizations in Iran, can help reduce vulnerabilities and strengthen disaster risk reduction. *"Robust disaster management infrastructure is essential for effective prevention and risk reduction, empowering communities to respond to hazards more effectively" (P7).*

### **Insufficient educational resources and programs**

Insufficient educational programs and events, along with inadequate resources and equipment at the community level exacerbate vulnerability to disasters. Conducting education and training in schools, universities, and other similar organizations, and informing people about possible disasters and their consequences, need to be considered. Furthermore,

people with special needs require specific education and training for disaster risk reduction and preparedness.

“The lack of preventive education in schools and the lack of exercises related to disaster management leave students and families uninformed about local hazards. Also, the lack of specialized human resources and special training programs for people with special needs hinders the creation of the necessary preparedness in the community” (P15).

### **Weak disaster risk communication and information infrastructure**

Disaster communication and information systems are important in all stages of disaster management and currently need to be strengthened in Iran. For instance, designing and implementing a community-based early warning system needs to be considered in hazard-prone regions. Establishing disaster risk awareness and information networks, especially in remote areas as well as applying the local community's facilities and knowledge have been ignored. In addition, the migrants and foreigners who live in Iran need to be informed about disaster preparedness and risk reduction.

*“Lack of access to accurate information and weaknesses in early warning systems leave people unaware of crises, and this lack of awareness can lead to poor decision-making and increased risks to life and property. When people are not aware of a potential hazard, they are unlikely to be able to take preventive measures, which can have irreparable consequences for society” (P16).*

### **Weakness of management/monitoring organizations**

According to the participants' experiences, the weak performance of organizations responsible for planning, implementing, and monitoring disaster risk reduction and prevention measures is evident. The lack of documenting and collecting valid information for decision-making, along with inadequate communication between related organizations, leads to duplicate work before and after disasters. Monitoring and assessment of communities' vulnerabilities and capacities as well as assessing the DRR and preparedness measures performed by the

related organizations, are insufficient.

*“The lack of transparency in government decision-making and the lack of effective monitoring systems lead to distrust among the public and reduce their cooperation in times of crisis. Furthermore, if executive officials do not receive the necessary training, their ability to manage crises is severely affected” (P6).*

## **Discussion**

Since the term “natural disasters” is regularly applied in academic disaster literature, exploring the “disasters are not natural” approach was focused on, using the experiences and perceptions of disaster researchers and scholars in Iran. To the authors' knowledge, few context-based studies specifically focused on the “disasters are not natural” expression and its various dimensions. In the current qualitative research, one main theme of human roles and interventions was explored, which consists of five categories: environmental degradation, economic vulnerability, political/governance vulnerability, socio-cultural barriers, and the vulnerability of disaster management infrastructure, as well as 16 sub-categories.

Human roles and interventions were found to be important triggers for turning natural hazards into disasters. That is, the combination of human actions and natural hazards can create a destructive disaster (22). Similarly, Kelman mentioned that people create the conditions for disaster occurrence, and thus, disasters are about people's daily lives and experiences (23). Therefore, the different types of vulnerabilities caused by human actions have resulted in devastating disasters so far (24). Accordingly, the Sendai Framework for Disaster Risk Reduction (SFDRR) highlighted the importance of vulnerability reduction and capacity improvement for effective disaster risk reduction worldwide. The SFDRR priorities for action (e.g., understanding Disaster Risk (DR), strengthening DR governance, investing in DR for resilience, and enhancing disaster preparedness for effective response and “Build Back Better”) underline the human roles in disasters. For example, the disaster recovery phase provides a privileged opportunity for integrating DRR measures into affected communities (3). Sustainable Development Goals (SDGs), which were adopted as a global partnership for the peace

and prosperity of the planet, are other examples of human roles in creating a world without disasters and catastrophes (3).

While part of the academic community argues that the term "natural disasters" is a misnomer, and the findings demonstrated the important aspects of the "disasters are not natural" approach in Iran, a few participants stated that they will apply the "natural disaster" expression since "natural" determines the type of disaster. They questioned why we need to remove "natural" from "natural disaster" since it refers to the natural element of disasters. Although their thoughts were not analyzed and considered as the findings, it can show the possible reason for using the "natural disaster" term by academic experts. That is, they believed in human roles and interventions in disasters but applied the "natural disaster" expression to highlight its type. Similarly, scholars advocating the use of "natural disaster" implied that there is no proof to confirm the negative effects of applying this expression (12).

Environmental degradation was identified as one of the human actions in making disasters an unnatural phenomenon. The environmental degradation examples pointed out by the interviewees included deforestation/desertification, improper waste disposal, and greenhouse gas emissions, which were also key drivers of climate change and disasters. Similarly, some authors argue that human-induced environmental changes, particularly deforestation and land-use changes, increase the intensity and frequency of climate-related disasters (25). Furthermore, deforestation has been recognized as a significant contributor to desertification and biodiversity loss (26), which exacerbates vulnerability, as highlighted in the study. Moreover, the production of greenhouse gases through human activities, particularly fossil fuel consumption, is widely acknowledged as a primary driver of global warming, leading to more frequent and intense droughts and floods (27). Thus, environmental degradation confirms the urgency of adopting DRR and sustainable development actions to mitigate the impacts of disasters and climate change. In the current study, economic vulnerability was identified as one of the human factors that make the population more vulnerable to disasters. Human decisions place them in catastrophic situations that

are not natural but triggered by human interventions (28). Regarding economic vulnerability, Stonich emphasized that the poor are the most vulnerable to environmental risks since they often live in hazard-prone areas and have fewer resources to prepare for or recover from disasters (29). Economic vulnerability has been identified as a barrier to disaster prevention and recovery, as people with insufficient resources have less intention to invest in disaster risk reduction measures (30). Furthermore, inadequate investment in disaster risk reduction infrastructure and preparedness can delay recovery and amplify the consequences of disasters (31). Thus, economic vulnerability highlights the necessity of addressing poverty and equitable resource distribution to empower populations living in hazard-prone regions.

The political/governance vulnerability reflects a reactive approach to disasters, demonstrating the human aspect of disasters. The United Nations Office for Disaster Risk Reduction (UNDRR) highlights the need for a shift from reactive to proactive disaster management (32). Reactive approaches tend to focus on response rather than prevention, leading to a lack of preparedness, inadequate coordination, and inefficient use of resources during disasters. In accordance with the findings, Mukherji *et al* argued that weak governance structures and poor institutional coordination hinder effective disaster response and recovery (33). Inadequate community-based approach policies are an important human action issue raised by participants and can show the importance of local knowledge and community involvement in disaster management. Disaster risk reduction is more effective when local communities are actively engaged in planning, decision-making, and response efforts (34). In particular, groups with special needs face higher levels of exposure to risks and have less access to resources during the response and recovery phases (35). Therefore, political and governance vulnerabilities suggest a shift from reactive to proactive, community-driven disaster management policies.

The interviewees exemplified socio-cultural barriers by referring to religious beliefs, a lack of disaster risk awareness, and prioritizing individual interests over collective interests. The effects of religious beliefs on people's actions regarding disaster risk reduction

have been reported in several studies (36,37). The concept of the Act of God implies that people have sinned and need to compensate for their mistakes (38). Therefore, disaster, as the “Act of God” addresses the population’s inability to prevent disasters and can encourage the use of the term “natural disasters” in the community. In other words, we need to start questioning whether disasters are acts of God or acts of humans in our community. Regarding the lack of awareness and perception of disaster risk, other studies emphasized the importance of education and public awareness in building resilience (39). For instance, it was reported that communities with higher levels of risk awareness are more likely to adopt effective disaster preparedness measures (40). Hence, socio-cultural barriers call for robust public awareness campaigns for disseminating the “disasters are not natural” approach and inclusive disaster risk reduction education.

The vulnerability of disaster management infrastructure was consistently identified as an important part of the “disasters are not natural” approach in Iran. Similarly, Deelstra *et al* emphasized that weak infrastructure in disaster-prone regions hampers effective information dissemination, undermines response capacity, and postpones recovery efforts (41). The finding regarding weak disaster communication systems is supported by several studies indicating that the lack of proper disaster communication infrastructure contributes to confusion and increased fatalities during disasters (42,43). Furthermore, the functions of disaster management systems need to be regularly monitored and assessed at different local and national levels. Monitoring and assessment are necessary actions for identifying gaps and improving disaster risk reduction measures in disaster-related organizations (44). Thus, infrastructural weaknesses point to the importance of investing in disaster communication systems, educational resources, and assessment/monitoring to ensure the performance of disaster risk reduction measures.

Finally, the findings support the importance of human drivers of disasters and the misnomer of “natural disasters” term since each disaster is social problem and social construct. Different types of vulnerabilities made by human actions and interventions confirm the necessity of taking “natural” out of the “natural

disasters” expression as well as the importance of disseminating the “disasters are not natural” approach in Iran’s community. However, the present study limitation includes its specific context, which may limit the generalizability of the findings to other settings. Furthermore, the participants were the academic experts/professors and researchers and the public and community members were not included for the data collection.

### **Conclusion and implications for the health system**

This study highlighted the critical human roles and actions in the creation of disasters and underscores the urgent need to reconsider the application of the term “natural disasters.” Similar to the “No Natural Disasters” campaign on Twitter, the community requires a virtual platform, social media, and other public awareness tools to disseminate the message that “disasters are not natural” to all Iranian citizens. The health system plays a key role in disaster risk management and in reducing the consequences of disasters caused by both natural and technological hazards, which reflects the importance of vulnerability reduction to make disasters unnatural (45). Furthermore, protecting people’s health from disasters is a social, economic, and political imperative that demonstrates the importance of disaster risk reduction measures (46).

In Iran, the Primary Health Care (PHC) network has been established as the core tool for healthcare delivery across the country. The PHC network promotes the provision of adequate context-specific healthcare services using its decentralized structure distributed in both rural and urban regions (47). Thus, the current structures, resources, and processes of the healthcare system in Iran can facilitate the mainstreaming of the “disasters are not natural” approach among Iranian populations living in rural and urban districts. The following implications have been suggested based on the dimensions of the “disasters are not natural” approach in the context of Iran:

- Health system can play a central role for raising public awareness in regard to preventing the environmental degradation such as deforestation, waste disposal and green gas emission. The relevant educational and training programs can be designed

and regularly performed by the healthcare providers in rural and urban regions.

- Since the health system is an important structure for implementing disaster risk reduction (DRR) in communities, it can highlight the DRR governance and management in parliament and governmental bodies. A disaster risk reduction program within health system should be integrated into a national framework and tailored to the specific needs and context of the community. In addition, pro-active approach to disasters and prioritizing the community-based interventions conducted with local people are the examples of DRR policy-making related to the health system. Vulnerable groups need more attentions in all policy-making, management and education efforts.

- PHC network uses the local healthcare workers who are familiar with the culture of their own communities. Therefore, the healthcare workers in rural areas (so-called Behvarz) as well as the healthcare providers in urban regions can effectively follow the disaster risk communication in the framework of community's religious beliefs and risk perception which are the triggers of considering disasters as natural events.

- All community-based disaster risk reduction interventions and measures can be improved and facilitated through the health system infrastructures and resources. For instance, designing and performing the disaster training and exercises based on the assessment and monitoring the hazard, vulnerability and coping capacity can be fulfilled by involving community members (*e.g.*, women, children, the elderly, *etc.*). Organizing and managing the community-based teams, providing the monitoring and supervision of facilities and resource allocations can be conducted by the health systems at local, national

and regional levels. Further research is required to explore the “disasters are not natural” approach concept and dimensions using the participation of different social groups and community members. In addition, designing the mixed method research for comprehensive investigation of this approach in the context of health systems is highly suggested. Finally, designing and implementing a joint research project for studying and comparing the “disasters are not natural” approach concept in different countries can be useful for future international efforts in this field.

### **Ethical approval**

The Ethics Committee of the School of Public Health and Safety at Shahid Beheshti University of Medical Sciences approved the study (ethical code: IR.SBMU.PHNS.REC.1402.092). The participants were informed about the study objectives prior to interviews and had the option to decline their participation at any stage. The participants were assured for their confidentiality and anonymity, including their official roles or responsibilities.

### **Funding**

The current research was funded by Shahid Beheshti University of Medical Sciences, Tehran, Iran. (Grant Number: 43006842).

### **Acknowledgement**

The authors would like to thank the participants for sharing their deep experiences and perceptions during the interviews

### **Conflict of Interest**

The authors declare no competing interests.

## **References**

1. Frankenberg E, Sumantri C, Thomas D. Effects of a natural disaster on mortality risks over the longer term. *Nat Sustain* 2020;3(8):614–19.
2. Jones RL, Guha-Sapir D, Tubeuf S. Human and economic impacts of natural disasters: can we trust the global data? *Sci Data* 2022;9(1):572.
3. United Nations Office for Disaster Risk Reduction. Disaster risk reduction glossary. Available from: <https://www.undrr.org/drr-glossary/terminology>.

4. Chaudhary MT, Piracha A. Natural disasters—origins, impacts, management. *Encyclopedia* 2021;1(4):1101-31.
5. Dewan A, Dewan AM. Hazards, risk, and vulnerability. Dordrecht: Springer Netherlands; 2013.
6. World Bank, United Nations. Natural hazards, unnatural disasters: the economics of effective prevention. Washington, DC: World Bank; 2010.
7. Raju E, Boyd E, Otto F. Stop blaming the climate for disasters. *Commun Earth Environ* 2022;3(1):1.
8. Ismail-Zadeh A. Natural hazards and climate change are not drivers of disasters. *Nat Hazards* 2022;111(2):2147-54.
9. McClean D. Sendai Framework 6th Anniversary: Time to recognize there is no such thing as a natural disaster—we're doing it ourselves. United Nations Office for Disaster Risk Reduction; 2021.
10. Blanchard K. NoNaturalDisasters—Changing the discourse of disaster reporting. Available from: <https://www.naturaldisasters.com>.
11. Chmutina K, von Meding J, Gaillard JC, Bosher L. Why “natural” disasters aren't all that natural. *openDemocracy*. Available from: <https://www.preventionweb.net/news/why-natural-disasters-arent-all-natural>.
12. Chmutina K, Von Meding J, Bosher L. Global Assessment Report on disaster risk reduction (GAR). 2019. Language matters: Dangers of the “natural disaster” misnomer.
13. Islamic Republic of Iran. National report on disaster reduction. World Conference on Disaster Reduction; 2005.
14. Ardalan A, Sohrabizadeh S. Assessing households' preparedness for earthquakes: an exploratory study in the development of a valid and reliable Persian-version tool. *PLoS Curr* 2016;8.
15. Ardalan A, Yusefi H, Rouhi N, Banar A, Sohrabizadeh S. Household disaster preparedness in the Islamic Republic of Iran: 2015 estimation. *East Mediterr Health J* 2020;26(4):382–7.
16. European Commission. INFORM risk country profile. Available from: <https://drmkc.jrc.ec.europa.eu/inform-index/INFORM-Risk/Country-Risk-Profile>.
17. UNDRR. There are no natural disasters. *PreventionWeb*; 2020.
18. Tahernejad A, Sohrabizadeh S, Mashhadi A. Exploring factors affecting psychological resilience of farmers living in drought-affected regions in Iran: a qualitative study. *Front Psychol* 2024;15:1418361.
19. Pourghasemi HR, Kariminejad N, Amiri M, Edalat M, Zarafshar M, Blaschke T, et al. Assessing and mapping multi-hazard risk susceptibility using a machine learning technique. *Sci Rep* 2020;10(1):3203.
20. Korstjens I, Moser A. Series: Trustworthiness and publishing in qualitative research. *Eur J Gen Pract* 2018;24(1):120–1.
21. Tahernejad A, Sohrabizadeh S, Mashhadi A. Designing a conceptual model of forming the psychological resilience among farmers living in drought-affected regions in Iran: a grounded theory study. *Curr Psychol* 2025:1–12.
22. Blaikie P, Cannon T, Davis I, Wisner B. At risk: natural hazards, people's vulnerability and disasters. Routledge; 2014. 496 p.
23. Aronsson-Storrier M, Dahlberg T. Disaster diplomacy: How disasters affect peace and conflict. Routledge; 2022. 182 p.
24. Mora S. Disasters are not natural: risk management, a tool for development. Geological Society, London, Engineering Geology Special Publications; 2009. p. 101-12.
25. Tyagi S, Garg N, Paudel R. Environmental degradation: causes and consequences. *Eur Res* 2014;81(8-2):1491.
26. Patel S. Deforestation and its impact on biodiversity loss. *Environ Sci Policy* 2021;114:1–10.
27. Bruhwiler L, Basu S, Butler JH, Chatterjee A, Dlugokencky E, Kenney MA, et al. Observations of greenhouse gases as climate indicators. *Clim Change* 2021;165(1):12.

28. Kelman I. Disaster diplomacy: How disasters affect peace and conflict. Routledge; 2011. 182 p.
29. Stonich SC. I am destroying the land!: The political ecology of poverty and environmental destruction in Honduras. Routledge; 2021. 208 p.
30. Noy I, Yonson R. Economic vulnerability and resilience to natural hazards: A survey of concepts and measurements. Sustainability 2018 Aug 11;10(8):2850.
31. Ishiwatari M. Handbook of climate change mitigation and adaptation. Cham: Springer; 2022. Disaster risk reduction; p. 3019-45.
32. Mukherji A, Ganapati NE, Manandhar B. Panacea or problem: new governance structures for disaster recovery. Int J Disaster Risk Reduct 2021;52:101960.
33. Imperiale AJ, Vanclay F. Conceptualizing community resilience and the social dimensions of risk to overcome barriers to disaster risk reduction and sustainable development. Sustain Dev 2021;29(5):891–905.
34. Baker LR, Cormier LA. Disasters and vulnerable populations: evidence-based practice for the helping professions. New York: Springer Publishing Company; 2014. 250 p.
35. Scott Z, Wooster K, Few R, Thomson A, Tarazona M. Monitoring and evaluating disaster risk management capacity. Disaster Prev Manag 2016;25(3):412–22.
36. Sun L, Deng Y, Qi W. Two impact pathways from religious belief to public disaster response: Findings from a literature review. Int J Disaster Risk Reduct 2018;27:588–95.
37. Tahernejad A, Sohrabizadeh S, Mehrabi Y, Mashhadi A. Investigating the conceptual model of the formation of psychological resilience in farmers affected by droughts in Iran using structural equation modeling. BMC Public Health 2025;25(1):1883.
38. Steinberg T. Acts of God: the unnatural history of natural disaster in America. Oxford University Press; 2006. 328 p.
39. Shaw R, Takeuchi Y, Rouhban B. Landslides—disaster risk reduction. 1st ed. Berlin: Springer; 2009. Education, capacity building and public awareness for disaster reduction; p. 499-515.
40. Appleby-Arnold S, Brockdorff N, Jakovljević I, Zdravković S. Disaster preparedness and cultural factors: a comparative study in Romania and Malta. Disasters 2021 Jul;45(3):664-690.
41. Deelstra A, Bristow DN. Assessing the effectiveness of disaster risk reduction strategies on the regional recovery of critical infrastructure systems. Resilient Cities Struct 2023;2(3):41–52.
42. Karaman B, Basturk I, Taskin S, Zeydan E, Kara F, Beyazit EA, et al. Solutions for sustainable and resilient communication infrastructure in disaster relief and management scenarios. arXiv [preprint] 2024;arXiv:241013977.
43. Fathollahzadeh A, Babaie J, Salmani I, Morowatisharifabad MA, Khajehaminian MR. Challenges of disaster risk communication from the perspectives of experts and affected people: a conventional content analysis. Int J Disaster Risk Reduct 2024;108:104553.
44. Voicescu GT, Lamine H, Loşonţi AE, Lupan-Mureşan EM, Luka S, Ulerio JG, et al. Monitoring and evaluation in disaster management courses: a scoping review. BMC Med Educ 2025 Feb 6;25(1):188.
45. Olu O. Resilient health system as a conceptual framework for strengthening public health disaster risk management: an African viewpoint. Front Public Health 2017;5:263.
46. World Health Organization. Health and disaster risk: a contribution by the United Nations to the consultation leading to the Third UN World Conference on Disaster Risk Reduction. Geneva: WHO; 2015.
47. Doshmangir L, Shirjang A, Assan A, Gordeev VS. Iranian primary health care network: challenges and ways forward. Prim Health Care Res Dev 2023;24:e1.