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Disaster Risk Reduction in Iranian Primary and Secondary School Textbooks: A Content Analysis

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Abstract

Objective: School textbooks have a significant role in transferring knowledge to the students and changing their behavior. This work aims to analyze school textbooks to find the representation of natural hazards in Iran, which is vital for supporting children in disaster situations.

Methods: In this study, a qualitative content analysis was used. Data were analyzed qualitatively by using MAXQDA 2018 software. For the 2019–2020 school year, 300 Iranian school textbooks in Persian language were collected.

Results: Findings of this work show that students receive information about disaster risk reduction (DRR) education through the primary and secondary grade levels in all 12 grades. The educational content covers various types of natural hazards, including geophysical, hydrological, climatological, meteorological, and biological disasters. In addition, the textbooks contain discussions about local hazards, causes and effects of disasters, and the disaster management cycle.

Conclusions: The coverage of DRR and the relevant contents in school textbooks reveals that the discourse of natural hazards is important for Iranian authorities, especially in the education system. This study helps decision-makers and practitioners design more effective interventions to prepare children for disasters.

Introduction

In recent decades, countries have experienced more natural hazards.¹ The International Federation of Red Cross and Red Crescent Societies (IFRC) has defined natural hazards as “naturally occurring physical phenomena caused either by rapid or slow onset events.” Natural hazards could be categorized as geophysical (earthquakes, landslides, tsunamis, and volcanic activity), hydrological (avalanches and floods), climatological (extreme temperatures, drought, and wildfires), meteorological (cyclones and storms/wave surges) or biological disasters (disease epidemics and insect/animal plagues).² If a community or a society is severely malfunctioned by natural hazards because of its vulnerability, exposure, and capacity, it is facing a disaster. As a result, disasters are not natural and, in this study, a distinction is made between a natural hazard and disaster. Iran is among the most disaster-prone countries in the Middle East and North Africa region.³ The World Risk Index report rated Iran’s vulnerability to natural hazards as high, which has resulted in a significant financial, social, and physical loss.⁴ Disasters in Iran have killed nearly 110 000 people from 1990 to 2019.⁵ Earthquake, flood, drought, landslide, and storm are the most frequent natural hazards in Iran. Earthquake and floods are among the deadliest natural hazards in Iran.⁶ These 2 natural hazards, along with drought, have cost the government more than other disasters in the last 100 years.⁶ Researchers showed that the severity and magnitude of some natural hazards, such as floods and drought, are increasing.⁷

Children are one of the most vulnerable groups during natural hazards, which influence different aspects of their well-being, including mental, physical, and social health.^{8–10} Child labor and child trafficking can be other consequences of natural hazards.¹¹ Moreover, child abuse often increases after natural hazards. The history of violence, parental substance abuse, poverty, and child labor are predictors of increased child abuse in disasters.⁸ It is important to note that children do not form a homogeneous group; the impact of the disaster on them is associated with their age, gender, ethnicity, social class, poverty, and level of income. Scholars are increasingly providing evidence to prove that disability intersects with the abovementioned factors.^{12,13} One way to reduce children’s vulnerability is to learn about natural hazards and reduce the risk

of disasters in schools. It helps children to build their skills to contribute to the disaster risk management as well as develop the attitudes and dispositions toward working collectively when their families and communities are threatened or affected by a disaster.¹⁴ Children's preparedness is crucial for disaster risk reduction (DRR) and, in achieving the latter, the education sector plays a key role.¹⁵ The 2030 Agenda for Sustainable Development Goals (SDGs) emphasizes DRR as a precondition to sustainable development.¹⁶ Three SDGs directly address and discuss DRR, for example, Goal 9 (Build resilient infrastructure), Goal 11 (Make cities and human settlements inclusive, safe, resilient, and sustainable), and Goal 13 (Strengthen resilience and adaptive capacity to climate-related hazards and disasters in all countries).¹⁷

The United Nations Educational, Scientific and Cultural Organization (UNESCO) and the United Nations Children's Fund (UNICEF) have developed a framework for integrating DRR into the education sector.¹⁸ They introduced 3 pillars of integrating DRR into a school safety framework, including safe learning facilities, school disaster management, and risk reduction and resilience education.¹⁹ Integrating DRR into the formal curriculum of Iranian schools appears to be a critical step in disaster risk education. The framework indicates 5 critical dimensions of DRR learning: knowledge of natural hazards, learning safety skills, knowledge of risk drivers, capacity building for risk reduction in society, and building an institutional culture of safety and resilience.¹⁹

Textbooks play a significant role in education, and their role in addressing the disaster effects on children has been acknowledged.²⁰ Textbooks are important as most teachers rely on them for teaching.²¹ Textbooks are the most vital educational sources and reflect the national culture and priorities in the country.²¹ In addition to knowledge and information, textbooks also transfer the political and social values of a society or a country.²¹ Thus, analyzing textbooks can reveal the approach of each society toward disaster preparedness.

Although many studies have been conducted on the evaluation of school-based disaster education, textbook analysis is not a popular method used globally to study DRR. Iran is no exception, and Iranian textbooks have not yet been assessed for their effectiveness in integrating DRR.

This study examines the representation of natural hazards in school textbooks of Iran as a disaster-prone country with high vulnerability at all grades of primary and secondary schools in the education year 2019–2020. Textbook content analysis in Iran is important in that it can show the extent to which one of the main resources available to children has dealt with natural hazards and ways to reduce their risk. This analysis can be effective for different groups of decision-makers. The Ministry of Education of Iran can use the findings of this book to improve its strengths and eliminate shortcomings to inform children about the risk of disasters. Relief organizations such as the Iranian Red Crescent Society can also benefit from the findings of this study to address textbook deficiencies through their training or not work in parallel with content production.

Literature

In a study, natural hazards in textbooks of the Philippines and the United States (Oregon and Texas) were investigated.²² Researchers of this study found that the natural hazards topics are represented in textbooks of 8 grades in the Philippines and 7 grades in the abovementioned states of the United States. Both countries have introduced multiple hazards in their school textbooks. Yet, there

are some missing concepts in US school textbooks, including vulnerability, natural hazard risks, and gender aspects of natural hazards.²² Japanese textbooks provide different information on natural hazards. However, they lack a holistic view. For example, according to a study on natural hazards representation in geography textbooks in Japan,²³ different natural hazards as well as their causes and effects were introduced.²³ Another study in Jamaica reveals that natural hazards are represented in social studies, science, and geography textbooks in all 6 grades of primary schools.²⁴

A study on natural hazards representation in textbooks was published jointly by UNESCO and UNICEF (2012).¹⁹ In this book, Selby and Kagawa examined 30 countries and studied the presentation of natural hazards in school textbooks.¹⁹ The study indicated that natural hazards are discussed in textbooks in different clusters, including natural science (in 20 countries), social studies (12 countries), geography (11 countries), language (10 countries), civics and citizenship (4 countries), health and physical education (4 countries), life skills (3 countries), civil defense or pre-military education (1 country), and agriculture (1 country). They presented a separate profile for every country. Nevertheless, the country profiles presented therein are brief, and countries' reports were used as references to data collection. Iranian textbooks were not included in that study.

Recently, the representation of disasters in textbooks for children with intellectual disabilities (ID) was investigated in a study in Iran.²⁵ Authors of that study indicated that 18 textbooks had content about natural hazards among 164 textbooks for children with ID in Iran. In addition, information about various natural hazards was presented in the textbooks for children with ID, including earthquakes, flood, extreme temperatures, droughts, storms, and epidemics. The educational system in Iran is different and separate for children without disabilities and children with disabilities. To educate children with disabilities, there is an organization called the Exceptional Education Organization. For children with ID, the textbooks are completely different than those for children without disabilities.²⁶

This current study contributes further to the previous studies. It provides a holistic approach to disaster and includes different forms of disaster. In addition, it provides analyses (and, consequently, recommendations) that are sensitive to time and place. The study acknowledges the dynamic nature of school textbooks and considers the most recent school year (2019–2020). Finally, it applies a systematic method to data collection and provides a scholarly analysis.

Methods

Content Analysis

A content analysis method was applied as the research technique in this study. Content analysis is one of the methodologies used for studies on health-related media messages.²⁷ The main purpose of content analysis is to collect texts and to analyze the various themes. Krippendorff (2018) defined content analysis as "a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use."²⁸ Our study applies the summative content analysis, an approach that starts with quantifying specific content in texts with the aim of understanding the context and, eventually, interpreting the content qualitatively.²⁹ The summative content analysis study starts with keywords. Keywords are recognized prior to and during data analysis and they are derived either from a literature review or according to researchers' interests.²⁹ As mentioned earlier, this

Table 1. Keywords used to search content in the textbooks

| | | | | | | |
|----------------------------|----------------|----------------|-------------|------------|--------------|-------------------|
| | | Hurricane | Tornado | Volcano | Earthquake | Tsunami |
| | Flood | Emergency | Crisis | Hazard | Risk | Fire |
| | Bushfire | Landslide | Haze | Sandstorm | Drought | Snowstorm |
| Natural Hazards | Severe weather | Heatwave | Cold wave | Avalanche | Thunderstorm | Disease epidemics |
| First Aid | Cut | Burn | Animal bite | Nosebleed | Fracture | Choking |
| Disaster Management | Preparedness | Risk reduction | Response | Resilience | Readiness | Drill |

Table 2. Number of textbooks in the education system of Iran

| Primary Education | | | | Junior High School | | Senior High School | | | | | | | |
|-------------------|---|--------------------|----|-------------------------|----|----------------------|----|--------------------|----|-----------------|----|-------|----|
| Primary Education | | Junior High School | | Mathematics and Physics | | Experimental Science | | Humanities Science | | Islamic Studies | | | |
| Grade | # | Grade | # | Grade | # | Grade | # | Grade | # | Grade | # | Grade | # |
| 1 | 5 | 4 | 9 | 7 | 15 | 10 | 17 | 10 | 17 | 10 | 18 | 10 | 20 |
| 2 | 8 | 5 | 9 | 8 | 16 | 11 | 17 | 11 | 16 | 11 | 16 | 11 | 17 |
| 3 | 9 | 6 | 11 | 9 | 15 | 12 | 16 | 12 | 15 | 12 | 17 | 12 | 17 |

study aims to investigate the representation of natural hazards in textbooks of the education system in the context of Iran. The following subquestions were designed to reach the objectives of the study:

- RQ1: Do all textbook clusters cover the DRR related topics? Do they cover the topic equally or not (meaning that some cover more relevant content and training tips than the others)?
- RQ2: Do all students in each grade of primary and secondary school receive information on DRR?
- RQ3: Do the Iranian school textbooks consider the causes and effects of natural hazards? Does the natural hazards management cycle include mitigation, preparedness, response, and recovery?
- RQ4: Is there any information about local and community hazards in the textbooks?

Context

This study focuses on the Iranian education system. The education system for children in Iran is divided into primary and secondary schools and is administered by the Ministry of Education. While there are diverse spoken languages in different parts of the country (eg, Turkish, Kurdish, or Lori), Persian is the official spoken and written language used as the medium of instruction in all schools. All textbooks are written and distributed throughout the country under the supervision of The Ministry of Education (MOE). Primary school includes 6 grades and primary education starts at age 7. Secondary school is divided into the junior high school (grades 7, 8, and 9) and senior high school (grades 10, 11, and 12). Students in the theoretical senior high school in grade 10 must choose 1 of the following 5 fields to continue their education: mathematics, physics, experimental science, human science, and Islamic studies. Besides the theoretical branch, there are 2 other types of senior high schools, including the technical-vocational/professional branch and the manual skills branch (Kar-Danesh). These 2 branches prepare students to directly enter the job market in the trading, agricultural, and industrial professions. The Kar-Danesh track develops semi-skilled and skilled workers, foremen, and supervisors. General textbooks are the same in all disciplines. In the 2019–2020 school year, 14 468 744 students were enrolled in primary and secondary schools.

Sampling Strategy and Data Collection Methods

In this study, all textbooks were screened with respect to the type of natural hazards, according to an initial list of keywords, including geophysical (earthquakes, landslides, tsunamis, and volcanic activity), hydrological (avalanches and floods), climatological (extreme temperatures, drought, and wildfires), meteorological (cyclones and storms/wave surges), and biological (disease epidemics and insect/animal plagues). The keywords related to natural hazards such as early warning, resilience, mitigation, preparedness, response, recovery, vulnerability, psychosocial support, first aid, volunteering, disaster risks, and local natural hazards were included. The keywords are summarized in Table 1.

For the school year 2019–2020, of all 300 Iranian textbooks in Persian language, 51 textbooks are for six grades of primary education, 46 textbooks for three grades of junior high school education. There are 203 textbooks for three grades of senior high school education in four fields including 50 textbooks for Mathematics and Physics, 48 textbooks for Experimental Science, 51 textbooks for Humanities Science, and 54 textbooks for Islamic Studies. All books are available on the official website of the Iranian Ministry of Education and can be downloaded from this website.³⁰ The number of textbooks by the level of education is shown in Table 2.

Units of Study

To decide on the inclusion or exclusion of the 300 textbooks, their contents were assessed. In the next step, the following data were extracted from the qualified textbooks: grade, textbook name, types of natural hazards, disaster management phases, risk reduction, number of pages covering disasters, total pages of textbook, gender, and diversity. Finally, all digital versions of the textbooks were entered into MAXQDA 2018 software.

Data Analysis

In this study, a narrative qualitative study was used for analysis.³¹ Categories were selected as the heading title of every subsection in the findings section. In addition, examples of each category are given in the form of a table in the text, which helps to better understand the content. All contents of the textbooks were carefully

Table 3. DRR topics of selected textbooks

| | No. | Grade | Textbooks | DRR Topics | Page(s) | Total Pages |
|--------------------|-----|-------|--|---|---------|-------------|
| Primary School | 1 | 1 | Science | Knowledge of risks, safety in house and community, emergency organizations | 1 | 103 |
| | 2 | 2 | Science | Causes of storms and storm safety tips | 3 | 103 |
| | 3 | 3 | Science | Drought and water shortage | 11 | 112 |
| | 4 | 4 | Science | Environmental protection (3) and its effect on our life on earth, water resources protection | 6 | 106 |
| | 5 | | Literature (Farsi) | An Iranian old poem about recovery after storm and coming back to normal life after hazards | 4 | 152 |
| | 6 | 5 | Social studies | Discussing compassion, care and empathy during natural hazards with affected people (psychosocial support), charity, humanitarian organizations, drought and water crisis in Iran | 6 | 111 |
| | 7 | 6 | Science | Earthquake waves, epicenter, causes of earthquake, earthquake in Quran (the holy book of Muslims), earthquake impacts (health, infrastructure, and social aspects), earthquake frequencies in Iran, earthquake risk reduction activities (mitigation, preparedness, response, and recovery), causes of volcano eruption, signs and prevention of infectious communicable diseases such as flu, cholera, malaria | 8 | 104 |
| Junior High School | 8 | 7 | Social studies (civil, history, geography) | Psychosocial support in natural hazards, charity, humanitarian organizations such as Red Crescent and International Committee of the Red Cross, drought, water crisis in Iran, emergency phone numbers | 11 | 185 |
| | 9 | 8 | Social studies (civil, history, geography) | Tsunami, earthquake and volcanic eruption in South Asia, drought and water crisis in Iran | 1 | 198 |
| | 10 | 9 | Social studies (civil, history, geography) | Displacement after natural hazards and conflicts, drought and water crisis in Iran | 1 | 196 |
| | 11 | | Science | Causes of earthquake and tsunami in terms of geology, earthquake-prone regions both in Iran and in the world | 2 | 176 |
| | 12 | | Defense readiness | Iran earthquake risk map, earthquake preparedness, assigning roles to students in different groups for earthquake preparedness, staying safe during earthquake drill | 24 | 112 |
| Senior High School | 13 | 10 | Defense readiness | First aid, response to fire, flood preparedness, all-hazard risk map | 12 | 136 |
| | 14 | | Geography | Sandstorms, deforestation as the cause of flood, role of meteorology in preparedness, drought and water crisis in Iran | 5 | 112 |
| | 15 | 11 | Geology | Causes and impacts of sandstorms, volcanic eruption, earthquake hypocenter and epicenter, waves of earthquake, what to do before, during and after earthquake, earthquake preparedness kit | 10 | 120 |
| | 16 | | Human and environment | Drought and water crisis in Iran, preparedness and response during drought, haze and sandstorms causes and effects, role of global warming in natural hazards | 26 | 120 |
| | 17 | 12 | Health and hygiene | Risks, how to use fire extinguisher, prevention and first aid of choking and fall, signs and prevention of infectious communicable diseases | 4 | 192 |

studied and coded in the software MAXQDA 2018. Codings were obtained by reviewing the sources as well as the authors' opinions.

Ethics Approval and Consent to Participate

This research has an ethics code IR.USWR.REC.1399.008 that was approved by the Ethics Committee at the University of Social Welfare and Rehabilitation Sciences.

Results

The results of this study are presented in 3 subsections, including description of level, risk management topics, and local hazards. In each subsection, examples are provided in tabular or quote formats. A summary of the findings is shown in Figure 1.

In this study, of all Iranian textbooks in the 2019–2020 school year, 17 books in different clusters contained DRR topics: natural

sciences (8 textbooks), social studies (4 textbooks), defense readiness (2 textbooks), language (1 textbook), civics and citizenship education (1 textbook), and health and physical education (1 textbook). Table 3 presents the overall DRR topics covered in different textbooks.

Description of Levels

Iranian textbooks discuss different natural hazards, including geophysical (earthquakes, tsunamis, and volcanic activity), hydrological (floods), climatological (drought), meteorological (storms), and biological (disease epidemics such as influenza, cholera, and malaria). Natural hazards were represented in the textbooks of all 12 grades.

In Grade 1, students learn about natural hazards, humanitarian organizations, and emergency phone numbers. In Grade 2, storms

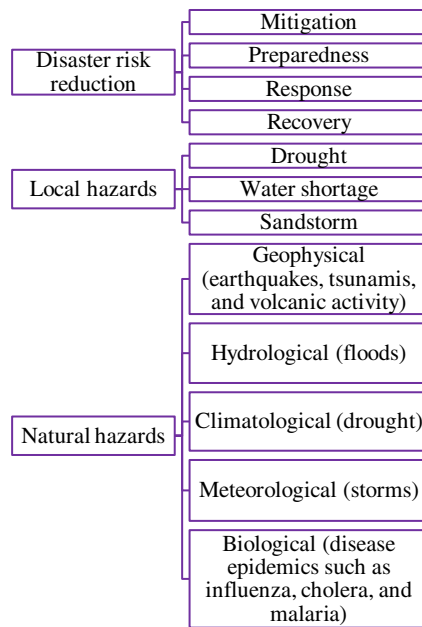


Figure 1. Summary of the themes and subthemes.

are introduced and teachers are supposed to discuss storm safety trips in the class. In Grade 3, water shortage and drought are indicated in the science textbook. Grade 4 focuses on protecting the environment, its relation to floods, and recovery after natural hazards. Additionally, students are encouraged to think about their own role in protecting the environment, energy, and water. Air pollution in Iran is also introduced in Grade 4. In Grade 5, students learn about earthquakes and volcanoes, and the role of community support in response to those disasters. In the social studies book in Grade 5, psychosocial support during disasters is discussed, accompanied by examples from humanitarian organizations. For instance, the role of Red Crescent Society in disasters is introduced.

At the senior and junior high school levels, more details are provided about the DRR concepts, which have been briefly introduced in primary school. For example, in the sixth grade science textbook, “dynamic earth” is introduced and students are provided with a recap on earthquakes and volcanoes. Thus, once again, more details about earthquakes, such as their definition, frequency (in Iran), impacts, and damages are provided. In the social studies textbook in Grade 7, water management is discussed in detail, and water shortage and drought in Iran are particularly elaborated through examples (Table 4). In Grade 8, some global level disasters are introduced. For instance, tsunami, earthquake, and volcanic activities in South Asian countries are investigated in the social studies textbook.

At the senior high school level, in defense readiness textbooks, Grades 9 and 10, earthquake preparedness and response are discussed once again. Students learn about earthquake-prone regions in Iran, preparedness, safety tips, and first aid. In Grade 11, the causes of earthquake, fire, and drought are represented in the geology textbook. The human and environment textbook of Grade 11 mostly discusses local hazards such as drought and the water crisis in Iran, preparedness and response during drought, sandstorm causes and effects, and the role of global warming in natural hazards. In the last grade of senior high school (Grade 12), the health and hygiene textbook provides the students with some information and instructions about risks and using a fire extinguisher.

Risk Management Topics

Among the 4 phases of the disaster management cycle, the Iranian textbooks for school students mostly cover disaster preparedness. On the whole, Iranian textbooks cover all different phases of the natural management cycle, and some examples are indicated in Table 4.

Mitigation

The Grade 4 science textbook discusses environmental protection and its impact on natural hazards. The Grade 6 science textbook gives information on earthquake mitigation strategies such as building strong houses. The Grade 11 human and environment textbook focuses on the role of global warming in natural hazards.

Preparedness

Primary education textbooks introduce the preparedness phase by giving information about emergency phone numbers and relief organizations. In Grade 9, students learn how to survive earthquakes by applying some skills such as “drop, cover, and hold on,” first aid, natural hazards risk map, safety tips, disaster kits, and firefighting. It should be mentioned that all safety tips in textbooks are related to earthquake preparedness.

Response

The response phase is presented only in the secondary education textbooks. For example, defense readiness textbooks (Grades 9 and 10) ask the students to organize response teams in the school, collaborating with their classmates. Response teams described in the defense readiness textbook Grade 9 are formed based on the Incident Command System (ICS), including a commander and 4 teams: logistics, relief and rescue, search, and firefighting. There are different systems for managing disaster response, 1 of which is ICS. ICS was designed to manage resources efficiently within a common organizational structure.³²

Recovery

Recovery is addressed in both primary and secondary school textbooks in the social studies cluster. Recovery after disasters is introduced along with 2 topics, including financial issues after natural hazards (insurance as a solution) and emergency shelters for displaced persons.

Local Hazards

In the science textbooks of Grades 4, 6, and 9, students learn about drought, water shortage, earthquake-prone, and volcanic regions of Iran. For example, the Grade 4 science textbook has presented a fact about earthquakes in Iran: “About 10,000 minor (low-intensity) earthquakes annually occur in Iran, recorded by seismographs but not felt by people, which release internal energy and prevent larger earthquakes.”

In the Grade 7 social studies textbook, children are asked to discuss recent earthquakes and floods in Iran via an activity. This textbook focuses on the different Iranian Red Crescent Society responsibilities, such as rescue, relief, and emergency shelter during natural hazards. Insurance is another topic covered by this textbook. In the defense readiness textbooks of Grades 9 and 10, there are activities and examples of the earthquakes that have occurred in Iran. The presented stories have been supported by a video.

The human and environment textbook for Grade 11 discusses some local hazards. For example, it deals with drought and water shortage issues: “Iran is geographically located in the arid and

Table 4. Examples of disaster cycle representation in the Iranian textbooks

| Disaster Phases | Example Quotes from Textbooks | Textbook | Grade |
|-----------------|--|-------------------|-------|
| Mitigation | “Stone is one of the most valuable resources God has created. Excessive use of rocks accelerates the depletion of this valuable resource. On the other hand, digging rocks from the ground and mountains may lead to floods.” | Science | 4 |
| | “Dear children, water is very important for our life and its shortage is extremely dangerous. Let’s consume water in the right manner.” | Social Studies | 5 |
| | “Activity: Look at the buildings in the pictures and list earthquake mitigation activities.” | Defense Readiness | 9 |
| Preparedness | “What are safety tips in life and which organizations help us in emergencies?” | Science | 1 |
| | “When I go to picnic with my family, I extinguish the fire after use.” | Social Studies | 4 |
| | “Activity: have you ever experienced an earthquake? Do you know what you should do before, during, and after an earthquake? Discuss it with your classmates and complete the table.” | Science | 6 |
| | “... during an earthquake, falling objects such as wardrobe, buffet and library may cause injuries and even casualties. That is why we need to prevent such objects from falling, in different ways.” | Defense Readiness | 9 |
| Response | “Focus on photos from newspapers and list the problems faced by the affected people after the earthquakes in Bam and Kermanshah.” | Social Studies | 7 |
| | “Activity: Suppose you are asked to support the people affected by an earthquake. One group should be dispatched to affected area and the second group should support the people from its own place. List the activities of two groups.” | Social Studies | 7 |
| Recovery | “Accident insurance is necessary for people after a fire, an earthquake and the like.” | Social Studies | 7 |

semi-arid regions of the world. Only 15% of its total area is covered by green vegetation, and more than 85% of our country is arid and semi-arid. On the other hand, due to the type of climate in Iran, only a small portion of total rainfall can be used.” In addition, the book explains about dust storms: “Dust storm is one of the environmental issues seriously affecting our country and most Middle East countries for more than two decades. This phenomenon causes numerous damages to the environment, community health, and infrastructure, as well as industrial facilities at regional, national, and local levels.”

Discussion

First, the strengths in the representation of natural hazards in Iranian school textbooks will be discussed and then a number of shortcomings will be discussed.

According to the findings, all types of natural hazards in terms of origin, including geophysical, hydrological, climatological, meteorological, and biological disasters, are covered in Iranian school textbooks. In addition, students in all levels receive information about natural hazards. The coverage of DRR and the relevant contents in school textbooks reveal that the discourse of natural hazards is important for Iranian authorities, especially in the education system. School textbooks reflect the rules and policies of the country and Iran is not an exception.²¹ For instance, earthquakes and drought are represented more than any other natural hazard, suggesting that these 2 disasters are more important for the policy-makers. During the last decades, Iranian textbooks have been structurally changed several times, and the last change was made in 2006, 3 years after the disastrous Bam earthquake.³³ Since the Bam earthquake, the Iranian Government has tried to prepare people for earthquakes.³⁴ In addition, over the past few decades, Iran has been experiencing a long-lasting drought and, consequently, water shortage.⁷ This concern, too, is reflected in the textbooks more than other natural hazards.

The findings also suggest that the textbooks partially cover the preparedness for communicable diseases. The experiences of the coronavirus disease (COVID-19) pandemic showed that the vital element in pandemics is preparedness,³⁵ particularly as Iran is one of the top countries affected by the COVID-19 pandemic.³⁶

Iranian textbooks not only deal with the nature of natural hazards, but also provide education on DRR and present several examples of international disasters as well. This is in line with international experiences concerning school textbooks (especially for geography textbooks), which have been reported in many studies all over the world.^{37–41} Researchers emphasized that a new global approach toward social studies is required to understand and address the impacts of globalization.^{42–44}

Representation of natural hazards in Iranian textbooks is in conformity with at least 6 goals of the Sustainable Development Goals agenda 2015–2030, including SDG3 (good health and well-being), SDG6 (sustainable management of water and sanitation), SDG11 (inclusive, safe, resilient, and sustainable cities and human settlements), SDG13 (combat climate change), SDG14 (conserve and sustainably use the oceans), and SDG15 (sustainable use of terrestrial ecosystems).⁴⁵

A significant issue emphasized in the Iranian school textbooks is psychosocial support in emergencies. Textbooks provide information and instructions on empathy, coping with disasters, and community support after disasters. Developing a psychosocial disaster preparedness program aligned with current policies, programs, and services will enable children to prepare for disasters psychosocially. It also makes the school system more effective in coping with children’s psychosocial issues during disasters.^{46,47}

This study indicates that textbooks provide children with historical local solutions to face local hazards. For example, “Wind Catcher” is introduced as a local solution for responding to extreme weather, and “Qanat” is introduced as a local solution for responding to drought and conducting water resource management. This is in line with other studies, for example, the study conducted by Bushnell et al. (2008), which shows that local

solutions to global problems play a vital role in climate change adaptation.⁴⁸

This study sheds light on a number of shortcomings in the representation of natural hazards in Iranian school textbooks. First, there is no information on landslides, avalanches, extreme temperature, wildfires, cyclones, and insect/animal plagues in Iranian textbooks. An all-hazard approach is needed in the design of textbooks and disaster preparedness programs for children⁴⁹ because there is no guarantee that various hazards will not occur, even if there is no history of it. Iran is a large country and there is a possibility of various hazards.⁵⁰ Children may even choose to live in other countries in the future, so being prepared will help their health. Second, DRR topics are not integrated into some key scientific disciplines. For example, natural hazards are not included in literature, art, or history textbooks. Natural hazards are mostly represented in textbooks in 3 clusters (natural sciences cluster, social studies cluster, and civil defense cluster). Additionally, 3 textbooks in other clusters have content about DRR (language cluster, civic and citizenship education cluster, health and physical education cluster). A comparative study by UNESCO (2012) about DRR representation in the textbooks of 30 countries revealed that most DRR-related topics in textbooks have come from the natural sciences cluster, social studies cluster, geography cluster, and language cluster. Fewer than 5 countries have represented DRR in other clusters' textbooks.¹⁹

Third, the multidimensionality of disasters has not been adequately emphasized in textbooks.⁵¹ Next, there is a gap in presenting key concepts such as resilience and vulnerability, early warning systems, evacuation, and forecasting.^{52,53} Although the escalation of violence against children is one of the consequences of natural hazards,⁵⁴ the case is not mentioned in Iranian textbooks. Studies have shown that physical violence, sexual violence, emotional violence, and child neglect increase after natural hazards.^{8,55,56} Therefore, it is necessary to give enough information to children and enable them to protect themselves.⁵⁷

Furthermore, climate change adaptation and the impacts of disasters on vulnerable groups (eg, children and elderly people) are missing topics in the textbooks.⁵⁸ Disaster risks are influenced by key axes of social determinants of vulnerability such as class status, education, occupation, income/assets, gender, race, ethnicity, caste, tribe, religion, national origin, age, and residence.^{59,60} These social determinants intersect, interact, overlap, and cluster together in their effects in times of disasters.^{61–63}

All Iranian textbooks are in Persian, despite the fact that different ethnic groups live in Iran with different languages. Ghaaderi et al. (2018) argue that more attention should be paid to local and indigenous languages in Iran.⁶⁴ Teachers in cities with ethnic diversity face various challenges. One of such problems is that all textbooks are in Persian as a single standard language. This restricts and endangers local languages, which are very diverse in our country.⁶⁴ Moreover, given the importance of learning safety tips against natural hazards, it is necessary to reflect on the issue of language.

Limitations

Due to the multidisciplinary of topics related to disasters and natural hazards, as well as the subjects of textbooks for primary and secondary school students, the discussion of its various dimensions was one of the limitations of this study. To interpret the findings, scientists in different fields were needed. It seems that researchers can use the findings of this study in various studies.

Conclusions

School textbooks play a significant role in transferring knowledge to students and changing their behaviors. For investigating DRR approaches in Iran, analyzing the textbooks is vital. Analysis of textbooks in Iran showed that natural hazards are represented in the textbooks of all 12 levels of schools. It was indicated that different forms of natural hazards are covered by textbooks. In addition, if the authors of school textbooks have more interaction with experts, the content of textbooks will be richer. This relationship must be 2-way. This means that researchers and experts in the field of disaster studies also need to provide their views on the content of textbooks to authors and the children's education system. This is a kind of advocacy for children's health in disasters. Intervention should be defined to prepare children for disasters by various organizations, including emergency organizations, to pay attention to the information provided to children in textbooks to close the existing gaps by providing the necessary skills training.

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