

<b>Access this article online</b>
Quick Response Code:

<b>Website:</b> <a href="http://www.jehp.net">www.jehp.net</a>
<b>DOI:</b> 10.4103/jehp.jehp_1263_20

# Health in disasters in Iranian schools: A systematic review

Seyednouredin Hosseinghousheh<sup>1</sup>, Maryam Feiz Arefi<sup>2,3</sup>, Amin Babai Pouya<sup>4</sup>, Mohsen Poursadeqiyani<sup>4,5</sup>

## Abstract:

Iran is disaster-prone country in the world. Lack of awareness and failure to have a proper response to natural disasters cause heavy damages to nations and national assets. Risk management is essential to prevent, intervene, and fight disasters as it can attenuate the destructive effects. The present study reviews studies on health in disasters in Iranian schools with an emphasis on readiness to deal with crises. The study was carried out through a systematic search using keywords in Persian and English in Iranian and international databases such as Google Scholar, SID, Magiran, Web of Sciences, PubMed, and Scopus. The time range of the search included all articles published before September 2020. The reference lists were also checked to find more articles. Totally, 575 articles were found and full-text of 32 articles were examined. After omitting repetitious items, the articles were checked by two independent researchers in terms of inclusion and exclusion criteria so that 15 articles entered the final analysis phases. The target population consisted of students, teachers, managers, and experts of disaster resilience. The articles were mostly focused on earthquake, fire, and structural safety. Implementation of health school models through improving awareness and crisis management knowledge in school officials plays a key role in improving and preserving health in school environment and safety of students. Measures like paying more attention to safety of building and physical space of schools, adding crisis management skills to curriculum as practical educations, informing parents about such risk, and educating students about safety and prevention of risks are recommended.

## Keywords:

Crisis, environment, health, safety, school

## Introduction

Crisis management is the science of preparing, preventing, and dealing with disasters and crises that await human societies. It has received more attention over the past years.<sup>[1]</sup> Crisis management covers five topics of organizing, communication, decision-making, detecting crisis factors, and design. Controlling a crisis is easier when it is possible to organize the forces to deal with it.<sup>[2]</sup> Crises attenuate the health and quality of life of man. Thus, the most important step to fight crises and

the caused problems is to plan before the occurrence of a crisis and to implement it during and after it.<sup>[3]</sup> Iran is disaster-prone country in the world.<sup>[4]</sup> Lack of readiness and failure to demonstrate the proper response to natural crises create heavier damages to nations and assets and some of these damages are irreversible. Natural disaster management can be a way to decrease such costs and keep societies safe against crises.<sup>[5]</sup> The safety of educational spaces has become a top concern in the world. Many countries have started to examine and analyze their condition and

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: [WKHLRPMedknow\\_reprints@wolterskluwer.com](mailto:WKHLRPMedknow_reprints@wolterskluwer.com)

**How to cite this article:** Hosseinghousheh S, Arefi MF, Pouya AB, Poursadeqiyani M. Health in disasters in Iranian schools: A systematic review. *J Edu Health Promot* 2021;10:365.

<sup>1</sup>*Social Determinants of Health Research Center, Yasuj University of Medical Sciences, Yasuj, Iran,* <sup>2</sup>*Department of Occupational Health Engineering, School of Health, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran,* <sup>3</sup>*Health Sciences Research Center, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran,* <sup>4</sup>*Department of Occupational Health and Safety Engineering, School of Health, Ardabil University of Medical Sciences, Ardabil, Iran,* <sup>5</sup>*Social Determinants of Health Research Center, Ardabil University of Medical Sciences, Ardabil, Iran*

## Address for corresponding:

Dr. Mohsen Poursadeqiyani, Social Determinants of Health Research Center, Ardabil University of Medical Sciences, Ardabil, Iran.  
E-mail: [poursadeghiyan@gmail.com](mailto:poursadeghiyan@gmail.com)

Received: 17-07-2020  
Accepted: 26-09-2020  
Published: 29-10-2021

seek solutions to prevent crises and improve safety in urban spaces.<sup>[6]</sup> School is the first society that children experience and with a good educational performance, schools can play a key role in the development of life skills in children. Every child spends 12 years in school where they learn and become prepared for life. They have their first experience of social life in school environment. Many mental perceptions, mindsets, beliefs, feedbacks to life in school, and classroom in children are tested and experienced.<sup>[2]</sup> Students are one of the main groups exposed to accidents and disasters.<sup>[1]</sup> According to the Japan Agency for International Cooperation, disasters have serious effects on educational services. In addition to the lost lives (including teachers and students), the sudden halt of educational activities causes mental disorders in children.<sup>[7]</sup> The Earthquake and Tsunami of 2011 in Japan damaged 6000 schools and killed 607 students and teachers.<sup>[8]</sup> In 2013 an earthquake in Philippine damaged 604 elementary schools and 92 high schools.<sup>[9]</sup> A fire in an elementary school in Zahedan-Iran in 2018 killed four students and set a new record of mortality caused by school fire in Iran.<sup>[10]</sup> The experienced crises in the world have shown us that despite the readiness in organizations and relief bodies (state or private) to attend the incident site in time and take required measures, they cannot have expected performance in the face of disasters due to different reasons.<sup>[11]</sup> Schools can be completely demolished or become nonfunctional due to earthquake in earthquake-prone regions.<sup>[12]</sup> It is possible to improve the safety and structural resistance of schools by implementing structures standard and providing the infrastructures. Through this, schools can be a safe environment and also a shelter for survivors of disasters. A comprehensive crisis management program can prepare managers to face crises that might occur at schools. In addition, they prevent or decrease damages caused by crisis.<sup>[13]</sup> Studies have shown that a major part of damages and losses is due to a lack of familiarity with the principles of safety and unsafe environment and failure to use safety equipment. Poor education can be the main reason for this.<sup>[14]</sup> The role of proper education in developing knowledge and the right attitude about safety and crisis is unquestionable. Therefore, the best target population to make a change in education style and attitudes about safety issues is children. Doubtlessly, educating, and creating readiness in students have a profound effect on the future safety of any society. The point is that students keep in mind whatever they learn and transfer that to their families.<sup>[15]</sup> Given the fact that Iran is located in a disaster-prone region and the importance of students' safety in the education environment, the

present systematic review study is health in disasters in Iranian schools with an emphasis on readiness to deal with crises.

## Materials and Methods

The study was carried out as a systematic review in all available Iranian and international databases including Web of Science, Magiran, SID, Google Scholar, PubMed, and Scopus. The search included all articles published at the first publication before September 2020. The keywords were "crisis management, HSE, school, and disaster" and the Farsi equivalents. The references of the found articles were also checked to find articles missed in the search. The articles on schools located in Iran in Persian and English were selected. Articles with incomplete information for data analyses were omitted. After removing duplicate articles, two independent authors checked the articles in terms of inclusion and exclusion criteria.

The flowchart of identifying and selecting articles is illustrated in Figure 1. Out of 575 articles, the full texts of 32 were examined and 14 articles entered the final stage of analysis.

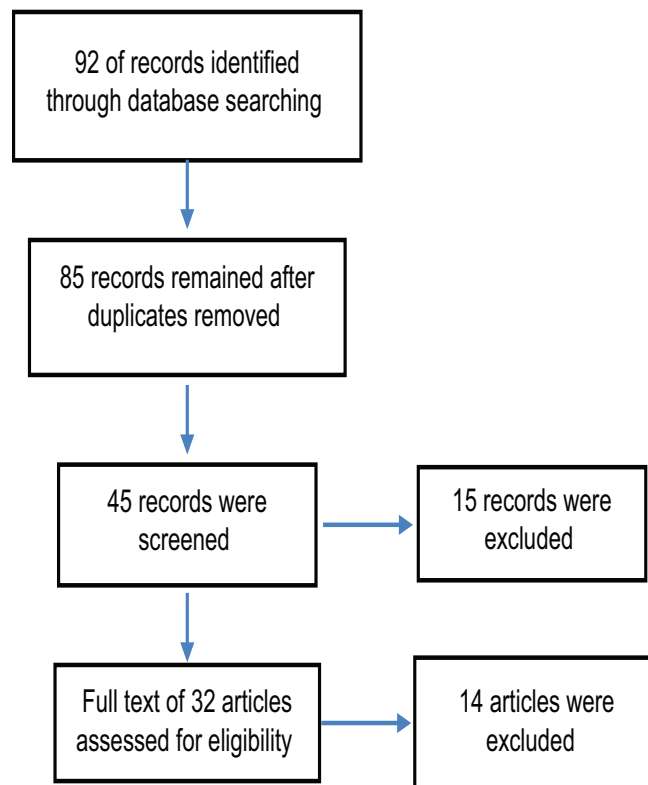


Figure 1: The process of identifying articles

**Table 1: Table of list of studies**

Row	Study	Years	Population	Region	Sample size	Design	Study method	Outcomes examined Key findings	Outcomes examined
1	Pourahmadi et al. <sup>[16]</sup>	2014	Students	Isfahan	180	Interventional	Questionnaire	Earth quake	If crisis management training programs in schools are accompanied by the necessary continuity and dynamism and the support of families, there will be significant changes in the level of awareness and performance of students during an earthquake The components within the school in the physical dimension, prevention and intervention are at a desirable level And the sub-component of health services and education has been very weak The results show that the most important factors to prepare for coping with crisis in schools are safety, observance of the primary standards and committees
2	Shirzad Kebria <sup>[17]</sup>	2013	School managers	Tehran	170	Descriptive-analytical	Researcher-design questionnaire	School buildings safety and vulnerability	
3	Nejadshokohi et al. <sup>[18]</sup>	2016	Principles and teachers in schools	Mashhad	Not reported	Analytical survey	Delphi, FAHP pairwise comparison, TOPSIS, and library resources	Crisis in schools	
4	Hadavandi and Hadavandi <sup>[13]</sup>	2014-2015	Principles and crisis experts	Shiraz	Principles: 110 Experts: 20	Descriptive-survey	Hierarchical analysis process questions and school readiness	Earthquake	Emergency planning and emergency action plans have the highest importance among preparedness programs. The level of readiness of high schools in Shiraz is below the optimal level The highest score was related to the performance dimension and the lowest score was related to school safety. Optimization of school architecture, building, enhancing organizational interaction, improving education in schools is effective in the resiliency of schools against disasters Most of the schools were in a medium level in terms of environmental health and safety and compliance with the national regulations of public health
5	Mirzaei et al. <sup>[19]</sup>	2018	teachers managers assistants	Yazd	238 teachers 94 principles 35 assistants	descriptiveanalytic	questionnaire	Resilience of schools against natural disasters	
6	Vosoughi <sup>[11]</sup>	2015	School space	Khalkhal	28 schools	Descriptive	Checklist	Environmental health and safety assessment of schools in using the crisis management approach	
7	Heidari et al. <sup>[10]</sup>	2019	Students	Zahedan	1 school	descriptive	Library review	Fire outbreaks in school	In the fire, the highest mortality rate has occurred. Increasing awareness of the risk of fire in schools is essential to promoting the culture of fire prevention in society
8	Abdoli et al. <sup>[20]</sup>	2013	Staff and health trainer	Rafsanjan	153 schools	Descriptive	questionnaire	Accidents and disasters	These schools have been the primary equipment for dealing with accidents, but there are no advanced equipment in any of the schools

Contd...

Table 1: Contd...

Row	Study	Years	Population	Region	Sample size	Design	Study method	Outcomes examined Key findings	Outcomes examined
9	Shahi and Esmaily <sup>[21]</sup>	2015-2016	Principals, teachers, students	Ielam	8 principals, 120 teachers, 291 students	Descriptive	Questionnaire, interview, check list	Earthquake	Students, managers and teachers were fairly ready to deal with the earthquake, but that wasn't enough preparation. In terms of physical dimension (resistance and building safety), schools have undesirable conditions
10	Taghvae M, Rahmani N <sup>[5]</sup>	2018	School space	Esfahan	142 schools	Applied survey-analytical	Field study	Earthquake	The resilience rate of the region's schools has been poor with respect to the underlying indicators and management. And these schools are vulnerable to potential crises
11	Maleki <sup>[4]</sup>	2018	School structure	Brojerd	32 schools	Descriptiveanalytic and survey	Library studies interview	Vulnerability of school structure	About 43.75% of buildings had high vulnerability. The most weakness in these centers is the safety and structure of these buildings
12	Vahdat and Smith <sup>[22]</sup>	2014	School structure	Iran earthquake prone regions	21 schools	analytical	Sources of data and interview with experts	Earthquake	Most of the buildings need to be resistant or reconstructed
13	Moradian and Nazoik <sup>[23]</sup>	2016-2017	students	Shiraz	332 students	Randomized field trial	Pretest and posttest with questionnaire	Disaster risk education	Educational method using role-playing was more effective than traditional lecture method for students, and it can be considered as a new approach to promote behaviors in disaster risk management
14	Gholami <sup>[24]</sup>	2020	Teachers	Sarchehan	110 teachers	Descriptive	Teacher made questionnaire	Designing and validating a curriculum framework of natural disaster risk reduction education in primary school	The results of factor analysis showed that teaching methods, content and purpose, evaluation methods, materials and resources and logic are the guidelines for reducing risk of natural disasters in primary period

## Results

According to the studies that have been searched, the research results of the original articles are given in Table 1 with explanations.

## Discussion

The studies on health at schools during crisis in Iran with emphasis on management and readiness to face crises were reviewed. The majority of studies focused on earthquakes, fire, and structural safety. The results showed that junior high schools in Shiraz had the lowest level of readiness.<sup>[25]</sup> Schools in Ielam were relatively ready to face earthquake, while they needed improvement in two area of skills and readiness. In addition, the school buildings were in poor condition in terms of structural stability and safety.<sup>[21]</sup> Shirzad Kebria showed that the intra-school elements were in a desirable condition in terms of physical aspect, prevention, and intervention. He also reported that the sub-scales of services and health education were at very poor level.<sup>[17]</sup> A study by Karande and Rao in India showed that because of absence of instructions for emergency situation management and lack of adequate physical equipment, trained and skilled staff, and funding, Indian schools were in poor condition.<sup>[26,27]</sup> According to Mehraein, safety of schools has a vital role in readiness to face disasters. Based on FAHP results, the main subscales to improve safety in school were improving structural safety and resistance against earthquake.<sup>[3]</sup> Taghvae M, Rahmani N. showed that the number of buildings, floors, classes, fire safety system, heating system, structure age, type of structure, and ownership were the fundamental indices of resilience during disasters. Managerial indices, physical space, human forces, emergency evacuation, relief services, and so on were also examined. The results showed that the schools were in poor condition in terms of these factors.<sup>[5]</sup> Maleki reported that the main problem in schools was safety and building structure.<sup>[4]</sup> One of the most efficient factors in school resilience is the geographical position. Easy access to a main street and relief services and safe distance from risks are recommended. Moreover, position of school building is important for safe evacuation and easy access to roads in the case of a disaster.<sup>[19]</sup> Grimaz and Malisan showed that proper positioning, structural codes, and construction quality control were the key factors.<sup>[28]</sup> some Iranian study based literature review<sup>[29]</sup> such as Mirzaei and Mohammadinia reported that resilience of elementary schools was higher than high schools.<sup>[19]</sup> A study in Turkey showed that readiness of high schools in the face of earthquake was higher than that of elementary schools. This can be explained by the better positioning of the schools.<sup>[30]</sup> The results showed that the classroom of younger students in educational

centers should be in lower floors. Elementary school buildings should not exceed two levels and if there are extra levels, they should be used for administrative and noneducational purposes.<sup>[31]</sup> One of the main measures in crisis management and emergency evacuation is to take the students' gender into account. There are mental, physiological, and physical differences between girls and boys and such differences should be taken into account in management plans.<sup>[5]</sup> One of the serious crises that may happen in schools is fire and as shown by statistics, there have been 56 fires in schools and dormitories between 1995 and 2019 and 50 of these cases have been with students inside the facilities. In addition, there have been physical injuries in 14 cases.<sup>[32]</sup> According to Mirzaei and Mohammadinia, one of the main reasons of fires in schools is the heating system, which makes fire alarm and safety systems with high resilience a necessity in schools.<sup>[19]</sup> To control the costs, some private schools might use nonstandard designs that cannot fulfill the functions of an educational facility and increase the risk of incidents at schools such as fire.<sup>[33]</sup> Studies have shown that nonstructural requirements have been neglected in renewal projects in some schools.<sup>[10]</sup> There is a need for instructions that require regular checks on safety equipment in educational centers in terms fire safety and other hazards.<sup>[18]</sup> In addition to supplying necessary fire extinguishers in schools, the students should be educated about keeping their calm during incidents and how to safely evacuate the facility when a fire extinguishing system is not available.<sup>[34]</sup> Schools fire statistics show that in 8% of the cases, the students were not able to leave the school because of blockage of fire escapes.<sup>[32]</sup> The number, dimension, and mechanical specifications of fire escapes are important factors in survival or users. Safe fire escapes should guarantee a safe exit in the worst fire scenarios in <2.5 min.<sup>[31]</sup> Aghili *et al.* studied schools in five provinces (Khorasan Razavi, Bushehr, Tehran, Gulestan, and Ardabil) and found that 69.6% of the schools in these cities did not have a proper fire escape for emergency situations.<sup>[35]</sup>

The results of studies on fire incidents have shown that the teacher's failure to detect the risk of fire in Shinabad School was the reason for negligence of the risk and not asking the students to leave the classroom.<sup>[33]</sup> In the case of a fire incident in an elementary school in Zahedan, the students used their benches as a protection instead of evacuating the school.<sup>[32]</sup> In Shinabad School, the school personnel did not know how to use fire extinguisher equipment or the equipment were expired.<sup>[36]</sup> These results indicate that education and having a safety plan affect accident prevention behaviors in students and personnel.<sup>[14,21]</sup> Elementary students are the best target group to implement changes in education style and attitudes about safety issues.<sup>[37]</sup> Curriculum design should use the results of research works on vulnerability to natural disasters.



[24] Moradian and Nazdik showed that playing game was more efficient than traditional lecturing methods in improving knowledge and risk management behavior in children. They recommended playing the game as a new educational approach.<sup>[23]</sup> According to Shiwaku *et al.* the key factors in resilience at schools were educational programs for teachers, personnel, students, parents, and individuals at risk, participation in preparation programs, sharing essential information, and participation of parents in school activities.<sup>[38]</sup> Tong *et al.* reported that combining curriculum, school regulation, emergency situation management, crisis management plans, and educations for disaster readiness programs were the key factors in improving resilience in schools against disaster.<sup>[39]</sup> Continuity and dynamism of educational programs are needed to make a change in awareness level and attitudes.<sup>[16,40]</sup>

Some of unpleasant incidents happen outside school perimeter and during field trips that may even cause death of students or teachers. Lack of education for school personnel and visiting nonstandard camps for camping are the causes of such accidents.<sup>[41]</sup> One of the key educations needed is psychological education after an incident or crisis.<sup>[19]</sup> Some students that witness bitter incidents might develop acute or posttrauma stress disorders.<sup>[41]</sup> Akariaee studied Tehran-based schools and showed that public schools, elementary and junior high schools held more earthquake and safety maneuvers than private schools and high schools.<sup>[42]</sup> Bajasteh Askari showed that privatizing does not necessary improve safety and health indices in elementary schools.<sup>[43]</sup> Abdoli *et al.* argued that there was a significant difference between schools in terms of equipment and presence of a health trainer. They reported that elementary schools were more equipped, and they had a health trainer.<sup>[20]</sup> There is a need for periodic assessment of safety condition of schools and their readiness to face disasters. Some measures need to be taken to make sure of adherence to legal requirements.<sup>[44]</sup> In this regard, experts' opinions, placing safety checklists in public spaces, and preparation of the infrastructures are recommended.<sup>[25]</sup> Adherence to HSE principles in schools as well as full ergonomics of the school environment can be an important principle in the resilience of schools in the face of disaster.<sup>[45-47]</sup>

### Limitation

Due to the lack of studies in this field, no limit was set for the start time. Furthermore, some articles were not available in full text because they were presented abstract at the conference. In general, less homogeneous and comprehensive research was founded on this subject.

### Conclusion

The results showed that implementation of health

school models through improving awareness and crisis management knowledge in school officials plays a key role in improving and preserving health in school environment and safety of students. By educating the next generation in this field, resilience and safety in society can be improved as well. Measures like eliminating or controlling environmental risks at schools, holding school evacuation maneuvers, equipping schools with first aid equipment and educating teachers, personnel, and health staff, paying more attention to safety of building and physical space of schools, establishing health safety and environment management system, providing easy access to first aid equipment, adding crisis management skills to curriculum as practical educations, informing parents about such risk, and educating students about safety and prevention of risks are highly recommended. In addition, supervising organizations should assess environment and safety equipment of schools based on safety standards.

### Acknowledgment

All of the authors would like to give their special thanks for their studies in this field.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

### References

1. Kamali Y. Comparison of crisis management structure in Iran, Japan, India and Turkey. *Strategic Stud Public Policy* 2018;7:89-245.
2. Rahimi E. Studying the importance and priority dimensions in crisis management from the employees' view. *Disaster Prev Manag Knowl (Q)* 2018;8:54-65.
3. Mehraein NZ, Kazemi M. The Study of Junior High Schools' Earthquake Preparedness in Shiraz City; 2017;8:1-2:92-104.
4. MalekiS, Goudarzi R. Assessing the vulnerability of educational buildings (primary schools) in Boroujerd. *Q Geogr Urban Plan Zagros Landsc* 2018;10:129-51.
5. Taghvae M, Rahmani N. An analysis of the status of Isfahan office buildings for urban crisis planning and management. *Q J Urban Manag Stud* 2017;8:20-101.
6. Hosseini SY, Damnabi AA. The Impact of Strategic Management on the Quality of Crisis Management Case Study: Railway Transportation Industry 2013;1:2:77-86.
7. Kalvir RH. Comparison of school yearnings and academic burnout in high school students. *School Psychol* 2016;4:60-75.
8. Kurokawa N. The experience of large earthquakes in Japan and impact on body physique in schoolchildren. *J Phys Fit Sports Med* 2018;7:15-8.
9. Iumin RC, Oreta AW. A post-disaster functional asset value index for school buildings. *Procedia Eng* 2018;212:230-7.
10. Heidari M, Jafari H, Heidari S. Zahedan school fire: Endless fire incidents in Iranian schools. *Disaster Med Public Health Prep* 2020;14:360-3.
11. Vosoughi M, Dargahi A, Teymouri P. Environmental Health and Safety Assessment of Schools in Khalkhal City Using Crisis Management Approach. *HDQ*. 2020;5(2):91-98

12. Bhatia S, Kheradmand M. Safe schools for the community: A case and tool for disaster-proof schools. *Disaster Prev Manag Knowl (Q)* 2015;5:69-79.
13. Hadavandi M, Hadavandi F. Evaluation the effectiveness of crisis management workshop training Kerman province-2009. *Q Sci J Rescue Relief* 2010;2:1:17-23.
14. Azeredo R, Stephens-Stidham S. Design and implementation of injury prevention curricula for elementary schools: Lessons learned. *Inj Prev* 2003;9:274-8.
15. Mirzaei S, Mohammadinia L. Importance of developing a local instrument of disaster-resilient school, letter to editor. *J Community Health Res* 2019;8:194-5.
16. Pourahmadi Sh, Taqi E, Ardeshtir A, Yarali N. Evaluating the effectiveness of school crisis management training courses, International Center of Academic Communication (ICOAC), University of Szczecin. 11-12 Devenber 2014; Szczecin, Poland.
17. Shirzad Kebria B. Investigating the dimensions and components of crisis management to provide appropriate solution for high schools in Tehran. *Journal of Educational Administration Research*. 2013; 16 (4):85-118.
18. Nejadshokohi F, Nji Azimi Z, Jameh Kurdkandi F. Comprehensive, Identifying and Prioritizing Factors Affecting Preparedness for School Crisis Using FAHP. Paper presented at: International Center of Academic Communication (ICOAC), University of Szczecin. 11-12 Devenber 2014; Szczecin, Poland.
19. Mirzaei S, Falahzade H, Mohammadinia L, Nasiriani K, Dehghani Tafti AA, Rahaei Z, *et al.* Assessment of school resilience in disasters: A cross-sectional study. *J Educ Health Promot* 2020;9:15.
20. Abdoli F, Sadeghei T, Esmaeilzadeh S. Schools plans for dealing with the risk of accidents and disasters in Rafsanjan in 2013. *Community Health J* 2017;10:12-8.
21. Shahi S, Esmaili M. Investigating the level of preparation to encounter the earth quake in Females' Secondary Schools of Ilam Province, (Dehloran and Moormoori) in (2015-2016). *Disaster Prev Manag Knowl (Q)* 2017;7:58-67.
22. Vahdat K, Smith NJ. A risk-based system for managing the retrofitting of school buildings in seismic prone areas: A case study from Iran. *Int J Risk Assess Manag* 2014;17:311-31.
23. Moradian MJ, Nazdik ZM. Game versus lecture-based learning in disaster risk education; An experience on Shiraz High School students. *Bull Emerg Trauma* 2019;7:112.
24. Gholami A, Javdani M. Designing and validating a curriculum framework of natural disaster risk reduction education in primary school. *Res Curr Plan* 2020;17:134-50.
25. Vatani J, Arami M, Khanikosarkhizi Z, Shahabi Rabori MA, Khandan M, Dehghan N, *et al.* Safety climate and related factors in rehabilitation nurses of hospitals in Iran. *Work*. 2021;68:189-96.
26. Karande N, Shah P, Bhatia M, Lakade L, Bijle MN, Arora N, *et al.* Assessment of awareness amongst school teachers regarding prevention and emergency management of dentoalveolar traumatic injuries in school children in Pune City, before and 3 months after dental educational program. *J Contemp Dent Pract* 2012;13:873-7.
27. Rao A, Rao A, Shenoy A. Are schools and teachers prepared to respond to health emergencies in children? A questionnaire study in Mangalore, India. *Int J Adv Res* 2014;2:1123-6.
28. Grimaz S, Malisan P. VISUS: A pragmatic expert-based methodology for the seismic safety triage of school facilities. *Boll di Geofisica Teorica ed Appl* 2016;57:91-110
29. Hosseinighousheh SN, Khammar A, Hosseini Foladi S, Ivanbagha R, Ahagh MH, Veisi R, Hami M, Poursadeqian M. Crisis Management at Iranian Schools: A Review Study. *Health in Emergencies and Disasters Quarterly*. 2019;5(2):63-70.
30. Öcal A, Topkaya Y. Earthquake preparedness in schools in seismic hazard regions in the South-East of Turkey. *Disaster Prev Manag Int J* 2011;20(3):334-348.
31. Mirsaeedie L, Shamsi A. Architectural design solutions to increase the safety of schools against fire. *Disaster Prev Manag Knowl (Q)* 2018;8:103-18.
32. Davarani ER, *et al.* Review of school fires in Iran: The causes, consequences and lessons learned. *Ann Burns Fire Disaster* 2020;33:53.
33. Khabar Online News. Take a Look at the Fires in the Schools that Led to The Deaths of Children. Available from: <https://www.khabaronline.ir/news/1213987>. [Last accessed on 2018 Dec. 17].
34. Hosseini M, Izadkhan YO. Earthquake disaster risk management planning in schools. *Disaster Prev Manag Int J* 2006;15:4: 649-661.
35. Aghili MM, Jafari AJ, Zia-oddini H. The assessment of establishment and maintenance of the health management system in schools and grading for awarding stars (HSE-ms). *J Isfahan Med Sch* 2010;28:107:248-258.
36. Taghizadeh AO, Mowafi H, Ardalan A. School fire in Iran: Simple actions save lives. *Ann Burns Fire Disaster* 2013;26:44.
37. Borzoi Khah Foumani M, Iraq AS, Barzegar N. Investigating the Change in the Attitude of Primary School Students in Qom Towards Safety and Crisis Management Issues in the Educational Center for Ready-Made Children in School (Com), in the First International Conference and the Fourth National Conference on Fire and Urban Safety; 2018.
38. Shiwaku K, Ueda Y, Oikawa Y, Shaw R. School disaster resilience assessment in the affected areas of 2011 East Japan earthquake and tsunami. *Natural Hazards*. 2016 May 1;82 (1):333-65.
39. Tong TM, Shaw R, Takeuchi Y. Climate disaster resilience of the education sector in Thua Thien Hue Province, Central Vietnam. *Nat Hazard* 2012;63:685-709.
40. Mostafawi Darani F, Larijani M, Saeedi M. Investigating the effect of education on the knowledge and attitude of primary school principals in Borkhar city regarding the establishment of health and environmental safety management system. *J Health Syst Res Spec Issue Health Educ* 2014;9(14):1889-99.
41. Omidvari S. Lack of a program to cope with crises in schools: Neglecting mental health problems of survivors of school disasters. *Iran Red Crescent Med J* 2017;19:6:1-3.
42. ZAKariaee L, Sepasi Moghaddam H, Najafi M, Farahi zad S, Kaveh Firouz Z. Evaluate the view of students of 10<sup>th</sup> overall maneuver of earthquake and safety in the schools. *Journal of Rescue Relief*. 2009;1(3):1-10.
43. Barjasteh F, Rezaee Z, Zibae Z. Comparison of the environmental health and safety status of governmental and non-governmental primary schools in Kashmar in 2015-2016. *J Torbat Heydariyeh Univ Med Sci* 2016;4:38-47.
44. Karbassi AR, Shahpasand M, Rajabi AA, Ghafari HA. Development of new citizenship HSE model for schools and kindergartens of Tehran Metropolitan City. *Int. J. Human Capital Urban Manage*. 2016;1(1):19-30.
45. Poursadeqian M, Arefi MF. Health, safety, and environmental status of Iranian school: A systematic review. *J Educ Health Promot* 2020;9:297.
46. Soltaninejad M, Babaei-Pouya A, Poursadeqian M, Feiz Arefi M. Ergonomics factors influencing school education during the COVID-19 pandemic: A literature review. *Work*. 2021;68:69-75.
47. Arefi MF, Pouya AB, Poursadeqian M. Investigating the match between anthropometric measures and the classroom furniture dimensions in Iranian students with health approach: A systematic review. *J Edu Health Promot* 2021;10:38.