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The importance of education on disasters and emergencies: A review article

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Abstract:

Disasters and emergencies have been increasing all over the world. Todays, with technological advancement, acquiring knowledge and its application in the realm of action is regarded as the only effective way for prevent disasters or reducing its effects. The present study aimed to review the importance of education and the effect of different methods of education on disaster risk reduction and preparedness in vulnerable people. To this aim, some articles indexed in Database of PubMed, Web of Science, Google Scholar, Scopus, Science Direct, and ProQuest were searched. The search was limited to reviewed articles in English published between 1990 and 2017. In addition, the selected articles were reviewed for relevant citations. The conducted studies were reviewed by two researchers independently. The primary search generated 128 relevant references. After eliminating the duplicates and articles which were not related to the review of the abstract, 41 references were identified for inclusion. After reviewing more, 31 references, which failed to meet inclusion index, were excluded from the study. Disaster education aims to provide knowledge among individuals and groups to take actions to reduce their vulnerability to disasters. During the last decades, the issue that trained people can be prepared for disasters and responding well has been extensively investigated. Based on the results, disaster education is a functional, operational, and cost-effective tool for risk management. Based on some evidence, it is important for vulnerable people to learn about disasters. There are different methods to educate vulnerable people, but no method is better than others. Trained people can better protect themselves and others. In this regard, planning and designing comprehensive educational programs are necessary for people to face disasters.

Keywords:

Disasters, education, vulnerable people

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Introduction

On the other hand, natural and man-made disasters cause serious disruption to a community, and there are many casualties, financial, environmental, social, and economic losses, which are beyond the power of the community.[1] As emergencies and disasters, along with their destructive effects, are rising all over the world acquiring knowledge and its uses are regarded as the most effective way to prevent disasters or reduce its effects with the advancement in technology.[2] Although the vulnerability of some communities and individuals to natural and human-made disasters is inevitable, the individuals can play a role in reducing these disasters by changing system resilience and disaster recovery capacity.[3-5] There is evidence that most injuries, damages, and deaths from disasters can be prevented and disaster preparedness measures such as housing adjustment against risks can reduce the damage caused by disasters and accordingly improve recovery. In addition, it is more effective when the

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people of a community have good cooperation in allocating resources and doing appropriate recovery after disasters.[6-8] Officials and policy-makers have focused on developing a new approach for persuading people and making leaps in disaster risk reduction such as training the children, the general public, especially vulnerable people by considering the increased risk of disasters and vulnerability due to climate change, development, increased income inequality, and low level of readiness among homemakers.[3,9-12] Disaster education for vulnerable aims to provide knowledge, skills, motivation in individuals and groups to take actions to reduce their vulnerability to disasters. Even, educating vulnerable people makes effective actions for other people or communities.[13] During the last decades, some studies indicated that trained people in society can be prepared for disasters and respond well. In addition, some reported that disaster education is a functional, operational, and cost-effective tool for risk management.[14] Further, some confirmed that low awareness and inadequate understanding of risk play a negative effect on people's readiness, response to hazard warnings, personal protection measures, and recovery.[15,16] Hyogo Framework for Action (HFA) (2005–2015) emphasized five performance priorities for reducing the risk of disasters in the world. The priority of the third function was to apply knowledge, innovation, and education in order to create a culture of safety and resilience at all levels. According to HFA, disasters are basically reduced when people are well aware and the motivation is to create a culture of prevention and resilience to disaster. In this regard, collecting and disseminating knowledge and information on hazards, vulnerabilities, and capacities, especially for vulnerable people should be prioritized.[17,18] In addition to, it is important to note that people who are vulnerable due to their limitations and conditions certainly need special training and attention with the help of trained and professional people.[14,17,18]

Materials and Methods

In this overview, we reviewed articles published in prestigious journals and websites during 1990–2017. Databases included PubMed, Web of Science, Google Scholar, Scopus, and Science Direct. The searched keywords included disaster, education, emergencies, vulnerable group, and target group. The primary search generated 128 relevant references. After eliminating duplicates and articles not related to the review of the abstract, 41 references were identified for inclusion. Then, 31 references not meeting inclusion index were excluded after further review. Among the papers, 11 articles were included in the study [Table 1].

In order to increase the validity and reliability of the study, the researchers searched the articles simultaneously and evaluated the quality of the articles separately. The inclusion criteria were the use of English for writing the papers on vulnerable people, being conducted in all parts of the world and evaluating education strategy and protocol. Finally, 11 articles were enrolled in the study [Figure 1].

Target group for disaster education

To make disaster education programs more effective for community members, target groups and individuals should be identified.[19-23] According to a division of vulnerable people to disasters can be classified as follows [Table 2]. The protocol and educational methods are not the same for all people in the community with levels of authority, education, and level of information. Therefore, the division of people leads to saving more time and energy spent on training and accordingly people learn more effectively.[24,23,25-28]

Table 1: Division of education for vulnerable people to disasters

Target Group	Member
Vulnerable people	Women
	children
	Seniors
	People with disabilities
Second-line teachers (people who can play a role in disaster education in some way)	Governors
	Policy-makers
	Local authorities
	Teachers
	University professors
	Taxi drivers
Rescuers and first helpers to the injured (people directly involved in disaster situations)	Relief and rescue team
	Volunteers
	Police force
	Firefighters

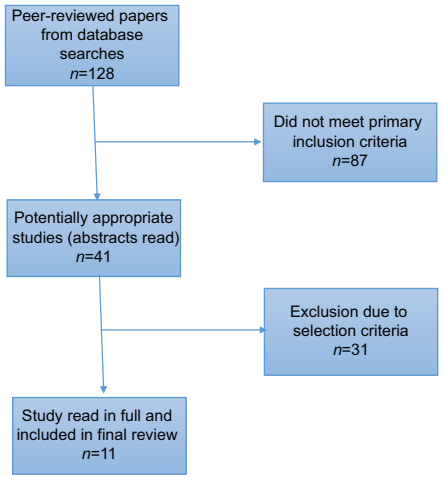

Figure 1: Flowchart of article selection process

Table 2: Characteristics of key studies

Reference number	First author	Year published	Year conducted	Study location	Subject/Sample	Type of study	Results
[2]	Wignyo Adiyoso	2012	November 2011	Aceh, Indonesia	169 school children	Questionnaire survey	Curriculum-based disaster education program was effective
[3]	Aldrich and Benson	2008	2007	Unclear	Unclear	Unclear	Chronic health conditions, older adults may have impaired physical mobility or cognitive ability, diminished sensory awareness, and social and economic limitations therefore have need a special program for education
[4]	Kerry-Ann, *et al*.	2008		Jamaica	Unclear	Unclear	Promotion of disaster risk education in schools and the twin effort of integrating children's needs into the comprehensive disaster management framework is the best approach to take in effectively protecting children during emergency situations
[5]	Gangalal Tuladhar and Ryuichi Yatabe	2015	Unclear	Nepal	106 teachers from 19 districts of Nepal	Interview	DRR education must be promoted to communities through the well-groomed schoolteachers which is very essential to reduce disaster risk in community and this will contribute to establish disaster safety society
[7]	Izadkhah Y and Hosseini M	2007	Unclear	Unclear	Unclear	Unclear	Community education programs can be more effective when they target specific groups or sectors of the community Typically "targeting" will focus the education effort on the potentially most vulnerable in society such as children, women, elderly and disabled, and will do so through the use of specific mechanisms and methods, most appropriate to each target group
[9]	Adwin Bosschaart	2016	2013	North-Holland	271 student	Pretest-posttest with an intervention group	The education program based on educational design research approach for flood improving personal perception and preparedness in student
[17]	Raya Muttarak	2013	2012	Thailand	557 households in the areas that received tsunami warnings following the Indian Ocean earthquakes on 11 April 2012	Interview	Formal education can increase disaster preparedness and reduce vulnerability to natural hazards Living in a community with a higher proportion of women who have at least a secondary education increases the likelihood of disaster preparedness
[29]	Johnson	2014	Unclear	New Zealand	38 paper in review and 2 case study	Thesis: review and case study	School drills do not teach all children adaptive response skill
[30]	Meng-Han Tsai	2014	2013	London	high school camps student	interventional	Game-based learning solutions that motivate the students through software design, utilizing a mode of learning that is joyful, and does not feel like traditional learning
[31]	Hoffmann and Roman	2015	May-August 2013	Thailand and Philippines	889 respondents (aged 20-75 years)	Interview	Education can raises disaster preparedness only for the vulnerable that have not been affected by a disaster in the past

Contd...

Table 2: Contd...

Reference number	First author	Year published	Year conducted	Study location	Subject/Sample	Type of study	Results
[32]	Petal	2008		Islamabad	Unclear	Unclear	The continuous implementation of formal and informal education through schools, with linkages to community-based risk-reduction promises the development of a "culture of safety," of societies less vulnerable and more resilient to the impact of disasters in the future

DRR=Disaster risk reduction

Disaster education for vulnerable people

According to the World Health Organization, vulnerability is a degree to which a population, individual, or organization cannot predict, cope, resist, and rehabilitate after the disaster and vulnerable people such as children, pregnant women, the elderly, malnutrition, and people with disabilities.[14-18] The significance of disaster education to different classes of society at all levels has been endorsed by a large number of studies.[33,29,34] However, it is worth noting that people who are vulnerable due to their limitations and conditions need special training and attention with the help of trained and professional people.[14,17,18]

Disaster education for children

Although there is little statistical information on the number of children affected by natural and man-made disasters in the world,[20,21,35,30,36,31] the United States estimated that around 1 billion children under the age of 15 are living in earthquake-affected countries.[37] In addition, more than 175 million children each year are facing with the crisis caused by climate change. Scientists and authorities have acknowledged that children are dependent on adults due to physical, emotional, and cognitive abilities for safety, as well as protection against emergencies and disasters.[5,9,38] During the recent decades, disaster education programs have been considered for children as an innovative approach to disaster risk reduction. Many theories have favored the usefulness of these programs. Education can increase the perception of risk among children.[19,33,29]

According to the studies conducted in various countries such as Japan, there is a direct link between education, increased risk perception, and students' risk reduction measures. Encouraging children to think about the importance of preventive measures and preparedness can bridge the gap between knowing and acting on knowledge.[9,19] Todays, disaster education should be explicitly addressed as a way to improve the level of child resiliency and information transmission to reduce the risk of disasters in their homes.[34] Table 3 indicates some benefits of starting an education at a lower age and schools.

Table 3: Some benefits of early childhood education

Benefits of early childhood education
Earlier onset disaster prevention education makes it easy for children to think about disaster issues, resilience, and risk reduction officials from an early age
Children tend to define what they have learned from their parents. As a result, education for children can gradually increase the level of awareness of the community
Individuals familiar with the concepts of hazards and disasters in their childhood can respond better and faster when disasters and accidents occur
People do not simply forget what they learn at an early age
In many countries, a high proportion of people in the community are children

There is an international consensus that disaster education programs for children will improve the preparedness and resilience among children and families against disasters. The evidence is well-documented in the Hyundai document during 2005–2015.[20] According to the results of some studies, people never forget what they learn at an early age. Therefore, it is very useful for people to learn disaster prevention and risk reduction methods from childhood.[6,8,9,38,39] The most important part of training children is related to the preparation phase for the disaster. As a result, it is very important for families, schools, and hospital staff to be well-acquainted with the significance of preparedness education for children.[8,40] In this regard, selecting the right population is considered as the first step in preparing disaster education for children. Children should be targeted at three levels of education including primary education for families, teachers, school administrators, educating managers and planners of hospitals, as well as training hospital staff. Families and schools are the first respondents for children at school ages at the time of disaster. Based on conditions and time, families or school staff may initiate first aid and manage the emergency evacuation of children to safe havens and hospitals at the time of the disaster. Therefore, training children is entirely dependent on the education of families and schools. Equalizing disaster risk education in the curriculum of schools at all levels, especially primary schools, is regarded as one of the main indicators towards this priority.[6,9]

Key education activities based on HFA include coordinating disaster prevention and preparedness activities at different levels in schools and universities, defining disaster risk education in reference books, building skills for teachers, curbing school safety programs, and employing children and students for planning community emergency management.[3,10,33,41] New Zealand and the United States are two examples of countries which focused on national education for children's education. Various types of disaster education programs for children have been registered, among which we can refer to formal and informal school-based programs and community and outside of the curriculum programs.[5,9,40] In recent years, Japan recognized the importance of preventing disaster education at an early age and designed a disaster prevention training booklet for elementary school and elementary schools with the help of officials and engineers. Further, there are some educational programs such as workshops, exercises and maneuvers, operational training, and preventive measures by children and showing the incidental points for children in this country is underway.[3,5,9,19,41] However, according to some studies, maneuvering in schools cannot be used alone to teach adaptive skills in response to disasters.[19]

Disaster education for women

Women are considered as vulnerable people and they face a lot of problems during the disaster.[5,16,39,42,43] According to the research results, women have a great interest in educating and preparing for emergencies and disasters. Disaster education for women can increase the level of education, awareness, and readiness among all members of the family, especially children.[17,21,29,43] Teaching women in different centers is conducted by formal and informal groups, mosques, schools, offices, and so on. However, there is still a need for basic measures in the field of disasters education. Some women become active members of the group after being trained and act as agents to educate other people in the community.[8] Special attention should be given to reproductive health issues in the proposed disability education for women.[12,42]

Disaster education for the elderly and disabled people

Elderly people need special training in specific ways with regard to physical conditions and cognitive impairment. In addition, psychological support for younger people by elderly is very important in disaster situations, which should be considered as one of the key tutorials.[5,11,42,32] If people with disabilities are informed about their disaster protection practices, they can save themselves without other people's help in such circumstances. According to some studies, training such people is directly related to their survival after disasters.[23]

Discussion

The main challenge and gap in the reviewed papers was that most countries have selected different models to design a training plan.[22] In addition, the impact of education was not systematically evaluated in most countries.[44,45] For this reason, many of the training programs are not effective and do not result in a proper change in the behavior and performance of vulnerable people.[21,22] For example, in Bam earthquake, many people were damaged due to lack of proper training and surprise, and vulnerable people did not consider their care and rescue methods. Further, in Kermanshah earthquake, a large number of people in subsequent earthquakes suffered from serious damage due to lack of proper knowledge of the situation and the fact that they came to the streets and stayed in insecure places, without leaving properly. Thus, schools, mosques, Red Crescent Centers, and nongovernmental organizations can provide training to these people.

Those responsible for education and research in the field of disaster education can be served to improve the level of education. Different methods of training can be used in this regard. Furthermore, different types of exercises and maneuvers can be applied for proper planning, which improves the level of knowledge and skills among individuals and is used as a method for evaluating the performance of individuals in simulated conditions. In addition, the maneuvers and exercises used for vulnerable people are different, and special attention should be paid to these people, although much attention has not been paid to these issues.

Disaster education is effective at all stages of the crisis, but its impact is even more in preparation. Therefore, more educational planning should be considered at this stage.[16-18]

According to some studies, effective measures for greater productivity and achieving the desirable standards of education for vulnerable people such as evaluating the pathology of existing educational activities for children, surveying educational work, recognizing successful and effective activities for children, involving the elites and thinkers concerned with the issue, changing the ways of education and culture, drawing up a vision document and act accordingly with educational standards, insisting on the continuity of programs, and using educational technology experience. Finally, disaster education is a functional, operational, and cost-effective tool for risk management in vulnerable people.

Conclusion

Based on the results, special attention should be paid to disaster education for vulnerable people. In this regard,

the disaster vulnerable groups should be identified and accordingly special training should be adopted for these people. It is worth noting that effective training can prevent or reduce the effects of some disasters. Trained people can protect themselves and others better. As a result, training can reduce human and financial loss due to disasters, which is regarded as a more important issue for vulnerable people although it has been less emphasized and there is no comprehensive training program. There are different methods to train vulnerable people although no method is the best method. Thus, it is necessary to plan and design comprehensive educational programs for those facing disasters.

Finally, it is suggested that vulnerable individuals should be designed and implemented by well-known professional training teams and adopting comprehensive and standard training programs for these people. Accordingly, the impact of these programs should be assessed to identify their strengths and weaknesses.

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Conflicts of interest
There are no conflicts of interest.

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