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Identifying the components and effective factors in disaster education to improve adolescents' resilience: A thematic analysis

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Abstract:

BACKGROUND: Education is considered one of the critical elements of behavioral changes in societies with a high risk of disasters. Meanwhile, the role of adolescents, as the key and the largest group of stakeholders in planning for disaster preparedness and response, has often been neglected. The current study aimed to extract the components and effective factors in disaster education to increase adolescents' resilience in disasters in Iran.

MATERIALS AND METHODS: This qualitative study was done by inductive approach through in-depth semi-structured interviews conducted with 21 key informants and 11 adolescents selected through purposive sampling. To extract the components and factors affecting education to increase adolescents' resilience in disasters, the data were analyzed by thematic analysis.

RESULTS: The effective factors in increasing adolescents' disaster resilience were classified into four categories, namely, social participation, need-based education, scope of influence, and governance perspectives, and 19 subcategories.

CONCLUSION: This study provided an overview and a comprehensive understanding of disaster education to increase adolescents' resilience. Recognizing these factors can help effectively in developing disaster education programs to improve adolescents' resilience against disasters. By encouraging natural hazard habits in this age group, it can also potentially increase the society's resilience in future.

Keywords:

Adolescents, disasters, education, resilience, society

Introduction

Disaster resilience education (DRE) means developing risk-related knowledge, skills, and strategies to enable learners to perform as active members in resilient communities.^[1] From the Yokohama Strategy, the Seventh Principle, and the Hugo Strategy where education to create a safety and resilience culture was one of the five practical priorities of the framework to the Sendai Framework (2015–2030), the priority of which is to reduce risk and recognize the disaster risk to promote

knowledge among government officials at all society levels, have all stated that education is the most significant element in promoting knowledge and awareness and behavioral changes in communities at risk of disasters.^[2–4] According to Bernardine, education is an effort to improve one's performance, which means changing one's knowledge, information, skills, attitude, and behaviors.^[5]

Despite the efforts to build readiness at the community level, particularly in vulnerable populations and high-risk

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areas, many researchers have reported low levels of preparedness.^[6] On the other hand, research has revealed that in planning for disaster preparedness and response, the role of people as the most important and the largest group of stakeholders has often been neglected.^[7] Community education is an essential part of flexible surge capacity (FSC). According to the World Health Organization's (WHO) recommendations, citizens should be able to rely on self-reliance, first aid, and other similar methods to respond quickly to major disasters.^[8] The purpose of disaster education is building individuals based on the concept of "three helps": self-help, mutual help, and public help, which became popular in Japan after the Great Hanshin-Awaji earthquake in 1995.^[9]

Some researchers have used community education guidelines in the form of behavior change theories to model readiness. Accordingly, the application of some models such as the Health Belief Model (HBM), Extended Parallel Process Model (EPPM), and Theory of Planned Behavior (TPB) has been considered effective in the field of emergency preparedness. However, the analysis method(s) chosen to show the relationship among structures, the type of hazard under study, and the effects of intermediate variables have revealed many paradoxes both between structures and between hazards, which need to be investigated more accurately.^[10] Furthermore, most of the studies have been done on specific age and social groups including adults and vulnerable groups such as pregnant women and older adults, while less attention has been paid to adolescents. In a few studies, adolescents' problems and social crises have been studied based on behavior change models. Nonetheless, there is no all-inclusive study on adolescents' roles and experiences at all stages of the disaster management cycle, and adolescents' participation in disaster risk management is usually abridged in the field of child participation including child-centered disaster risk reduction programs and analysis of children's participation in humanitarian programs.^[11] Yet, evidence has confirmed that the participation of children and adolescents in community preparation efforts can be beneficial.^[6]

Up to now, most studies have been conducted on risk education programs performed by teachers at schools.^[6] In a few studies, disaster education to improve resilience and social empowerment has shown a kind of age gap. It seems that due to adolescents' status between independence and dependence, their social roles in resilience and social empowerment have been neglected. Based on the research carried out in numerous fields regarding advanced thoughts and feelings, during adolescence, social cognition is formed and the role of energy, creativity, resourcefulness, knowledge, social communication, and adolescent enthusiasm is

highlighted. Since behavior is strongly controlled by habits that develop over a period of time, encouraging adolescents toward natural hazard habits in vulnerable areas will potentially increase the future resilience of the community because these habits are likely to persist into adulthood. The current study aims to extract the components of and effective factors in disaster education to increase adolescents' resilience in disasters in Iran.

Materials and Methods

Study design and setting

This qualitative study was done in 2021. The research approach was inductive, and information was collected through in-depth, semi-structured interviews. The study data were analyzed by thematic analysis to extract the components of disaster education to increase adolescents' resilience in disasters. Based on the WHO's and United Nations International Children's Emergency Fund (UNICEF)'s definitions, adolescents were considered individuals aged 10–19 years.

Study participants and sampling

In-depth and semi-structured interviews were conducted with health experts and specialists in disasters and emergencies, community education, communications and risk information, crisis, and risk management. Eleven adolescents were also interviewed to obtain their views on disaster education and disaster resilience. Qualitative data analysis was performed by the thematic analysis method. The inclusion criteria of the study were having at least a master's degree in disaster management or community education, having at least 3 years of work experience in disaster management and community education, and having executive records and related research. In case the specialists were not willing to participate in the study before or during the interviews, they were excluded. The participants were selected via targeted and snowball sampling. In other words, each specialist introduced the next specialist. In this way, information-rich individuals were identified. After that, they were informed about the goals and importance of the research and their consent was obtained. Then, they were referred to at an appropriate time and the interviews were conducted. It is worth mentioning that numbers #1, #2, ... were used to refer to the participants.

Data collection tool and technique

In-depth and semi-structured individual interviews were conducted. The experts and specialists were asked semi-structured questions to talk about disaster education to increase adolescents' resilience to disasters. The following semi-structured questions were asked: 1. "How can adolescents' resilience to disasters be improved?" 2. "What are the strengths, capacities, and opportunities of adolescent education to increase disaster

resilience?" 3. "What are the weaknesses and challenges of educating adolescents to increase disaster resilience?" and 4. "How can community education be expanded among adolescents to improve disaster resilience?" Follow-up questions such as "how," "why," and "can you explain more about..." were also asked during the interviews.

A total of 32 interviews were conducted with 21 specialists and 11 adolescents. The interviews were ended when data saturation was reached. Each interview lasted for 45–75 min. The interviews were conducted by the researcher and were transcribed instantaneously after completion.

Data analysis was done concurrently with data collection. In doing so, all the interviews were written verbatim immediately after being recorded. Notes were also taken during the interviews. Thematic analysis was used to analyze the data. By extracting the concepts from the items, initial codes were assigned to each of the concepts and were categorized into sub-main and main categories. The resulting codes were then categorized into potential themes. The report was analyzed and written by reviewing, defining, and naming classes, subcategories, and themes. If necessary, the interviews were provided to the participants to correct or add materials. At the end of the interviews, the texts were manually analyzed, codes and themes were categorized, and categories and subclasses were extracted. After analyzing the texts of the interviews, removing duplicate codes, and reanalyzing them, 976 codes were extracted, which were classified into four categories and 19 subcategories.

To ensure the accuracy of the qualitative data, Guba and Lincoln's criteria^[12] were used:

Trustworthiness: It is the same as internal validity. This criterion was investigated through measures such as prolonged engagement, peer review, and triangulation techniques.

Transformability: It is equivalent to external validity. The researchers achieved this goal by providing more details about the participants and using special coding procedures.

Dependability: This criterion is equivalent to reliability. The researchers found this by reflecting on data stability and providing complete details about the interviews.

Conformability: This criterion is used to confirm findings. To attain this, the objectivity index was used in the research. This means that several transcripts of the interviews were provided to the methodological and

research experts who were familiar with qualitative studies to ensure the accuracy of the analysis process.

Ethical considerations

After obtaining the necessary permissions and a letter of introduction from the Vice-chancellor for Research and gaining the approval of the security office of Shiraz University of Medical Sciences, the researchers introduced themselves to the participants, explained the purpose of the research, and assured them about the confidentiality of their information. After that, the participants who were willing to participate in the study were selected. They were assured that if they did not intend to continue cooperation at any research stage, they would be excluded from the interview process.

Results

The demographic characteristics of the participants have been presented in Table 1.

The factors affecting adolescent disaster promotion education were classified into four main categories, namely, social participation, need-based education, scope of influence, and governance perspectives. The subcategories have been listed in Table 2.

Social participation

According to the participants, the adolescents were extremely influenced by the behaviors of adults in the community and their family members, particularly their parents and peers. In other words, the behaviors and actions of these people were highly effective in the adolescents' behaviors. Many of the key informants believed that this could be used as an opportunity to shape appropriate behaviors and habits in the event of disasters:

"Most adolescents look at their parents and adults and if adults are indifferent to disaster-related issues, adolescents will be indifferent, too." (P. 1)

Table 1: Participants' demographic characteristics

Feature	Number
Gender	
Male	20
Female	12
Education level	
PhD	17
PhD candidate	4
Student	11
Field of study	
Health in disasters and emergencies	10
Crisis and risk management	4
Community education	5
Communication and risk information	2

Table 2: Classes and subclasses obtained from the interviews conducted to extract the factors affecting disaster education to promote adolescents' resilience

Category	Subcategory	Meaning units
Social participation	Social impact	Adolescents' effectiveness in the behavior of adults and peers
	Organizations and social associations	Involving groups and associations and creating educational campaigns
	Social sensitization	Social beliefs and participation in a social task
Need-based education	Parents and family members	Involvement of family members in children's educational affairs
	Formal education	Including educational content in textbooks or providing a disaster-related course
	Continuity	Continuation, persistence, and repetition of disaster education programs
	Educational content	Attractive content based on the needs and interests of adolescents
	New technologies	Capacities of computer games such as disaster simulator games
	Indirect education	Indirect messages without fear or coercion, education in the form of games
Governance perspectives	Practical and skill training	Deep learning and skill development with training and practical exercises
	Characteristics of adolescents	Education effectiveness, personality, and age traits in adolescents
	Critical infrastructure	Comprehensive development of the country and strengthening of infrastructure
	Specialism	Capacity of specialists in disaster management structures and planning
	Localization	Experiences of successful countries and localization of their programs
Scope of influence	Policies	The government's intention for policymaking and planning for disaster education
	Scientific research	Governmental support and directing research and academic projects to disaster-related issues
	Communications and media	Strengthening communication and information in the media and cyberspace
	Organizational interaction	Coordinated activity of responsible organizations
	A comprehensive and focused program	Comprehensive and centralized process planning

The participants also mentioned that planning for the existing social organizations or associations, creating educational campaigns, and involving citizens in social tasks to make the concept of disasters a priority for adolescents could encourage adolescents to participate in disaster education courses. The capacity of the private sector, such as companies, groups, and various institutions, as producers of educational content can also be effective in providing educational content information and sensitizing people in the community.

"Using the capacities of non-governmental organizations is effective. These organizations recruit members based on their fields of activity. Then, like the activities of the Red Crescent Society or the Red Cross, they train the members and these members transfer the training to different people in the community in a cascading way." (P. 2)

Need-based education

The lack of continuity, permanence, and repetition of disaster education programs in the community was stated by the experts as one of the main challenges in improving resilience. The participants believed that educational programs and activities were more highlighted during disasters and were gradually forgotten. In addition to wasting resources, the target groups and learners were out of reach for future courses and the coherence of the educational materials was lost.

"Education is not permanent; they conduct an educational intervention for a while and then give up. That is, we lose learners. Interventions must be continuous, uninterrupted, and purposeful to gradually change the knowledge and attitude

of adolescents to change behavior and, ultimately, to create resilience." (P. 1)

According to most of the experts, educational content should be designed and developed based on the interests and needs of adolescents. The unattractiveness of the content, excessive attention to a particular danger, and scattering, multiplicity, and large volume of information reduce the learning rate as well as the adolescents' desire to learn about disaster-related contents. Inadequate, erroneous, and inefficient education can be mentioned as other determinants of the levels of awareness and resilience in disasters.

"Providing educational materials tailored to adolescents' intellectual, psychological, personality, and age skills such as storytelling, games, drawing competitions, and drama is very effective." (P. 3)

Some interviewees found indirect education and nonverbal messages (observing adults' behaviors) more effective, particularly if these teachings were presented and expressed by parents or adult family members without fear and compulsion in an appropriate way such as stories, games, theater, and entertainment.

"Indirect education is very effective in adolescents. It is even more effective than direct education, because there is a compulsion in direct education. Adolescents are encouraged to perform and pursue these activities by observing their parents' behaviors in topics such as unstructured retrofitting or fire prevention." (P. 4)

Governance perspectives

According to the experts, the government's determination is not enough to implement educational programs, and resilience is not a priority in governmental policies and programs. The government's view of disaster management is traditional and, as a result, disaster management activities are carried out passively. Therefore, it is required to change the attitudes of managers and officials toward long-term planning.

"Disaster resilience must become a matter of governance. In all parts of the government, from parliament and government to managers and officials of departments and organizations, there must be will; they have to be willing to do something about it." (P. 5)

Using the experts' capacity in disaster management structures and plans in the country, not paying attention to the political tendencies of individuals in the body of disaster management expertise, directing research and academic projects to activities related to resilience in disasters, increasing governmental support, and encouraging scientific institutions and centers to work in this field were among the items mentioned by the participants.

"Disaster management issues should not involve people's political leanings. Efforts should be made to attract experts to executive and academic systems to implement scientific concepts, and academic research should be directed to disaster management issues." (P. 14)

Scope of influence

The participants specified that mass media such as television failed to communicate well with adolescents, which caused them to receive more information from the cyberspace. On the other hand, the tremendous volume of misinformation in the cyberspace resulted in confusion among adolescents.

"Our mass media cannot communicate very well with the audience, especially adolescents, and cannot be very effective. For example, when disasters occur, instead of interrupting programs and giving warning subtitles, radio and television either ignore the issue or do not provide very informative messages." (P. 1)

"I am interested in educational materials about disasters, but there is very little information about this and education centers are not available." (P. 27)

Some experts stated that the activities of various organizations in disaster education were the cause of dichotomy or multiplicity of the educational content, loss of resources, and boredom of the audience. In other words, the coincident activity of several systems has led

to a lack of fair distribution of education in the society. The participants maintained that an organization in charge of disaster education was much more effective in interacting with other organizations to exploit the potential of all organizations, departments, publications, and even national and virtual networks.

"Different organizations in the country are involved in education, and each receives a separate budget. Because they work without interaction and a comprehensive program, some audiences are not trained at all, while some are trained two or more times by different organizations. These contradict the teachings provided in some cases. In addition to causing the loss of resources, it can make the audience bored." (P. 17)

Discussion

The results of this qualitative study revealed that the adolescents were strongly influenced by the behaviors and actions of different people in the society, particularly parents and adults. Jalala *et al.*^[13] also confirmed that students were strongly influenced by the words of counselors, teachers, and school principals. In other words, the appropriate reactions of these people could be very effective in managing students' emotions and increasing their coping capacity. Similarly, Mooney *et al.*^[14] referred to teachers, school principals, and peers as the sources of students' confidence and empowerment through behaviors, self-support, and flexibility in response to needs. In other words, they could help adolescents adapt and recover.

Generally, parents' participation in educational programs is an effective way to understand disaster risk, resilience, and adaptation. Thus, the better the risk-related interactions with parents, the higher the children's awareness, behaviors, and risk perception will be.^[15] Moreover, increasing the interaction between parents and schools and encouraging and involving families can lead to a better preparedness and an increased literacy level.^[16] The participation of family members in their children's educational affairs was another item mentioned by the experts. Asking adolescents' opinions in family issues, prioritizing disaster education programs for adolescents, and involving them in other extracurricular activities such as sports and language teaching can improve their resilience against disasters. The findings of the research carried out by Muzenda-Mudavanhu *et al.*^[17] revealed that even though children were the main causes of contact with risks, they were not listened to and their opinions were not taken into account. Furthermore, students positively affect their parents' knowledge, whereby the quality of the child-parent relationship positively affects the success of intergenerational learning effects. Since the transfer of knowledge, attitudes, and practices depends mainly

on individuals' concepts as well as on the quality of the relationship between children and parents, the need for a strong relationship between schools and families has been continuously emphasized.^[13,17] There is an international consensus that disaster education programs for children will improve the preparedness and resilience among children and families against disasters.^[18]

Nowadays, very few issues related to resilience are often indirectly integrated into school curricula. Likewise, the concept of disaster preparedness and awareness has not been well implemented in schools, and disaster risk reduction programs are more about gaining knowledge and less about achieving attitudinal changes among adolescents. Additionally, no emphasis has been put on achieving long-term attitudinal changes. This necessitates expanding the scope and depth of disaster-related issues to include contemporary and future hazards.^[13,19,20] The analytical results of the present study also revealed that the presence of a disaster-related curriculum at schools could be effective in increasing resilience. The more these materials were included and the more the number of study years, the better and more effective it would be. In other words, integrating disaster risk reduction education through schools was one way to ensure that messages would reach all households and communities and that learning would continue in future generations.^[17]

According to the key informants in the present study, education based on books and pamphlets is not common today. In fact, all accident situations can be simulated using virtual reality or augmented reality computer games.^[21] Thus, adolescents learn the necessary items while playing the game. These results were confirmed by Feng *et al.*^[22] Virtual game education, unlike booklet education, had a significant effect on knowledge acquisition and effectively increased students' preparedness for earthquake emergencies. Additionally, training through virtual games significantly increased students' safety knowledge about appropriate behavioral responses. Using intelligent technological tools for learning could effectively improve learning, as well.^[23]

According to the experts, disaster education should not be one dimensional. Disaster resilience, while theoretical, requires skills. Hence, resilience skills should also be taught to adolescents. Nonetheless, experiential, interactive, and pragmatic learning activities are infrequently used.^[19] Action-based learning alongside the concepts of classroom theories can help learners better understand the challenges of sustainability and act in meaningful ways.^[24] In the present research, most experts agreed that there was much more theoretical education than practical training, which prevented deep learning from occurring.

Regarding the "Words into Action" guidelines, adolescents' participation can be achieved through inclusive disaster risk reduction and resilience policies, improving household preparedness, improving the health of children and adolescents, and creating safer communities.^[25] Adolescents can be organized based on the education they receive in different organizations and can act as a support group in accidents. Adolescents can even be involved in operational and scenario-based works. Amri (2017) also demonstrated policymaking in disaster risk reduction education, partnerships between schools and other stakeholders, and staffing and budgeting as the key issues in disaster risk reduction education. Thus, organizations and departments should increase awareness of education-related policies to reduce the risk of accidents in all educational institutions.^[26] In the research performed by Muzenda-Mudavanhu *et al.*,^[17] adolescents considered the threat of disasters due to the lack of resources, poverty, fragile environment, fragile economy, weak infrastructure, lack of political will, and lack of awareness of appropriate preparedness programs. They were not even aware of the disaster management plan in the community and were waiting for the help of the government as well as non-governmental organizations. These results indicated that disaster preparedness depended on resource availability, political commitment, and social support, rather than the level of awareness and concern. The results of the present analysis also revealed that when people underestimate the quality of construction, especially in metropolitan areas, and believe that the vital infrastructure of the society has many problems, they may think that in the event of a severe accident, there will be no point in taking refuge due to the high volume of building demolition. Thus, they may consider education useless and will not participate in trainings. Therefore, the success of disaster education programs depends on the comprehensive development of the country, especially economic development.

The results of the research conducted by Zhong *et al.*^[15] indicated that knowledge gained from television and friends helped promote adolescents' behaviors, while the Internet had a significant impact on increasing children's awareness of disasters and was the most widely used resource for creating resilience among students.^[13] On the other hand, the more adolescents know about an accident, the more willing they will be to take action on it.^[19] Hence, the scope of influence of cyberspace and social networks can be used to publish appropriate content in the spaces where adolescents are present. This is of utmost importance in the current situation when distant education is being followed at schools due to the spread of the coronavirus.

Improvement of disaster resilience requires a comprehensive and focused program such as process

programs, in which adolescents learn various educational topics during the process and achieve the desired goal. Education is a long-term, time-consuming, and ongoing process. Given the extent of different types of disaster, education and information must be in the process form. In this way, wherever an accident occurs, adolescents can apply some of what they have learned. There is also a need to strengthen community-school interactions through joint community risk assessment activities.^[20] According to Trott and Weinberg,^[24] informal after-school planning alone is not sufficient to address the challenges of resilience and sustainability properly; it is necessary to change policies on a larger scale with a focus on school reform by recognizing students' potential to become agents of change in their communities. Nonetheless, no system can educate different groups in the society. Therefore, comprehensive interactions among organizations are needed for the teachings to be transferred among people themselves.

Limitation and recommendation

The main limitation of the current study was that only adolescent students were interviewed, because it was difficult to identify, access, and obtain the consent of other adolescents. Consequently, future studies are recommended to assess the opinions of the adolescents who do not attend schools. Further studies are also suggested to distinctly evaluate the role and degree of importance of each of the extracted components.

This study has several implications including creating a new perspective for policymakers and planners about adolescents who are not only vulnerable and cannot strengthen their skills and resilience in disasters, but can also strengthen social resilience and facilitate ways to achieve sustainable development by influencing their family members and peers. This study can also be useful in planning to improve resilience in this age group by showing the challenges and opportunities of disaster education in adolescents.

Conclusion

This study offered an overview and all-inclusive understanding of disaster education to increase adolescents' resilience. Since the key informants of this study were selected from a wide range of people and the opinions of the adolescents were taken into account, disaster education to increase resilience was evaluated from diverse aspects. According to the experts, disaster education is the basis for creating resilience in communities. Besides, educating the lower age groups of the society, especially adolescents, can facilitate the achievement of social resilience to disasters. Even though small steps have been taken in disaster education in Iran, there are still many problems and challenges

that require comprehensive, focused, and purposeful planning with the participation of organizations and various members of the society. Based on the current study findings, increasing the effectiveness of disaster education activities to increase adolescents' resilience depends on social participation, education based on adolescent needs, changing governance perspectives, and increasing the scope of influence of the educational activities.

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Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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