

## Adolescents' Resilience: A Qualitative Study about Experiences of Bam Earthquake Survivors

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### Abstract

**Background:** Earthquake is the most catastrophic disaster that has harmful psychological, economic, social, political, and cultural effects on societies. Resilience or ability of a person for adapting to post-earthquake problems and crises is influenced by known and unknown factors. The present study aimed to explore experiences of Bam earthquake survivors about adolescents' resilience in that time.

**Methods:** This is a qualitative study with a directed Content Analysis approach. The participants were a total of 34 individuals including; 10 teachers and 24 parents of the students who had earthquake experience in adolescent period. The subjects were selected based on a purposive method. The sampling was done until data saturation from the junior high schools in Bam city, Iran, in 2019. Data collected through in-depth and semi-structured interviews and analyzed by Granehim and Lundman method.

**Results:** Data analysis yielded 565 primary codes, 217 conceptual codes after integration, 25 subcategories, and 6 categories from the participants' experiences about their resilience against the disasters and earthquake. 6 categories include: disaster consequence, beliefs about resilience, beliefs about strengthening resilience, factors affecting resilience, consequences of facing disasters, the necessity of disaster preparedness.

**Conclusion:** Participants stated different opinions and experiences about resilience and the factors that enhance or reduce it. They emphasized the necessity of preparedness and acquiring different skills for coping with disasters. Therefore, it is suggested that crisis management officials use these experiences to devise measures to prepare communities, before the occurrence of disasters, to support during and after disasters, to decrease the problems of future crises and to enhance resilience in communities, especially among adolescents as the next generation of society.

**Key Words:** Adolescent, Disaster, Earthquake, Experiences, Resilience.

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## 1- INTRODUCTION

Disasters are a serious disruption in the functioning of a society that leads to economic or environmental damage; and have widespread negative effects on human societies so that the affected society cannot adapt to disasters by relying on internal resources (1). According to numerous studies, many countries experience different types of disasters every year (2). Iran is one of the most prone countries for disasters (3), which is the fourth country after India, China, and Bangladesh and the sixth country in the world in terms of disaster victims and emergencies (4). Earthquakes are the most catastrophic disaster that has harmful psychological, economic, social, political, and cultural effects on societies and changes the fate of several generations (5). Other effects of the earthquake on communities include serious damage to infrastructure, high mortality rates, making people homeless, forcing them to live in shelters, exposure to harsh environmental conditions, and numerous physical and psychological complications (6).

In all parts of the world, children and adolescents are large groups of people who are strongly affected by these events. For example, according to UNICEF findings in 2007, about 200 million children experience physical disabilities related to disasters (2). It is estimated that 175 million children a year are affected by natural disasters related to climate change, and if they survive, about 5-43% of them will experience post-traumatic stress disorder, depression, anxiety and a variety of mental disorders (7). In other words, disasters have a significant impact on personality development and psychological development of children and adolescents (2).

These psychological effects have a massive impact on the individual and the communities (8). Montazeri et al., two years after the Bam earthquake, showed

that 41% of the participants lost 3 to 5 family members. The prevalence of severe mental health problems was reported to be 58%, which was three times higher than the general population (9). According to the ranking of the most important disasters of the last thirty years, Iran has been among the top ten countries in the world in terms of the number of deaths due to the occurrence of deadly earthquakes in Rudbar and Bam (10).

The Bam earthquake was one of the most devastating types of earthquakes in the history of Iran, which occurred at 5:26 AM on December 25, 2003, with a magnitude of 6.3. It destroyed most of Bam city and the nearby villages and the official death toll exceeded 26,000 with more than 30,000 injuries and 75,000 left homeless (11). Instead of focusing on disaster vulnerabilities, many current studies examine people's tolerance (12). Therefore, the factors that make people more adaptable to the needs and threats of life are the most fundamental structures studied in this approach, and among them, the term "resilience" is of particular importance (13).

Resilience is a person's confidence to overcome stress and to have the ability to cope (14). Resilience has been mentioned as one of the protective factors against future risk factors (15).

Resilience is a complex concept that is composed of various moral, social (environmental), cultural, and political dimensions; and it is influenced by various individual factors including age, gender, education, race, social factors, access to resources (16), the society culture and level of training about ways of coping with stress (17). Numerous quantitative studies have been conducted on resilience (2, 18-20); But the existing knowledge about the criteria of this kind of resistance, especially in the face of disasters, is still negligible (2). In other words, a comprehensive definition of resilience

against disasters has not yet been provided (21) since resilience is a complex concept that all of its dimensions are not properly understood. Therefore, it is necessary to deeply and carefully study the experiences of survivors of disasters. Accordingly, the researcher decided to clarify experiences of the Bam earthquake survivors who were adolescents, i.e., in the age range of 10-19 years (22) at that time and their perceptions towards resilience against disasters. It is hoped that the results of this study will have a positive impact on building a resilient society.

## **2- MATERIALS AND METHODS**

This is a qualitative study with a directed content analysis approach.

**2-1. Participants:** The participants were a total of 34 individuals (10 teachers, 13 student's mothers and 11 student's fathers) from the junior high schools of Bam city, Kerman province, South East of Iran.

### **2-2. Inclusion criteria**

Voluntary participation in the interview along with the ability and desire to express ideas, having experienced the earthquake of Bam in adolescence period (10-19 years), and filling the consent form. The subjects were selected based on a purposive method which continued until data saturation (when further codes are not extractable).

### **2-3. Data collection**

The study was conducted qualitatively with a directed content analysis approach. Data were collected through in-depth and semi-structured individual interviews. The average interview time was 45-60 minutes. The interview began with a key question about earthquake experiences and resilience against its consequences: "How did you experience the earthquake?" Questions such as "Give an example, please", "Explain more, please" or "Talk about your specific opinion, please" were used where needed.

### **2-4. Site and time of interviews**

The interviews were conducted from October 2019 to December 2019. The sites of interview were conference rooms, empty classrooms or the prayer room of the schools. The interview time was determined based on the free times of the parents and teachers and in coordination with the school principal and educational deputy.

### **2-5. Data analysis**

At the end of each interview day, data was analyzed based on the steps suggested by Graneheim and Lundman (23). All of the interviews were considered as the unit of analysis. And the evident and latent themes were identified in the text, through the following steps: First, transcribing the interviews word by word immediately after each interview. Then, reading the text several times to obtain a general comprehension of the content; afterwards dividing the text into meaning units, summarizing and coding the meaning units, categorization of the initial codes into categories and subcategories based on their similarities and differences (using inductive process). And finally, the themes were extracted as expressions of the contents embedded in the data. The data obtained from each interview was a guide for the subsequent interview. Thus, sampling was continued until data saturation.

### **2-6. Data Rigor**

Was assessed through Lincoln and Guba method (24). In order to confirm the accuracy and credibility, the interview texts and extracted codes were given to participants the next day. They discussed the accuracy of extracted concepts and their coordination with the main opinion. In case of any contradiction, the issues were considered. To assess the dependency, the expert's panel and external check (review of extracted codes by a team of experts) were performed. To

check the transferability, the maximum variety of participants with respect to age, social and economic class, education grade and school type were included.

### 2-7. Ethical Considerations

First, the permission of the ethics committee of Kerman University of Medical Sciences was obtained for conducting this research. Before starting the interview, the researcher introduced himself and explained the research objectives to the participants, asked their permission to record the interviews, and requested to sign a written consent. Participants were also reassured about the confidentiality of their information and voices. They were free to leave the study at any stage at their discretion.

## 3- RESULTS

Out of 34 participants (PNs) (PNs 1-10 teachers, PN 11-23 mothers, and PN 24-34 fathers), 30.7% of mothers and 100% of fathers were employed. In total, 14.8% of the participants had education levels of high school and lower, 67.6% had bachelor's degree and 17.6% had master's degree or PhD (**Table 1**). Data analysis yielded 565 primary codes, 217 conceptual codes after integration, 25 subcategories, and 6 categories from the participants' experiences about disaster resilience (**Table 2**). 6 categories including: disaster consequences, beliefs about resilience, beliefs about enhancing resilience, factors affecting resilience, consequences of facing disasters, the necessity of disaster preparedness.

### 3-1. Disaster consequences

This category consists of three subcategories of "Spiritual evolution", "life destruction" and "anxiety".

#### 3-1-1. Spiritual evolution

Going through a spiritual transformation, growing up, reaching evolution, being content and feeling satisfaction in life, and

appreciating the blessings of well-being were among the experiences of some of the study participants.

*"The earthquake transformed me. After the earthquake, I was no longer that 15-year-old boy. I felt I had grown a lot. I changed from a thoughtless teenager to a responsible person" (PN. 8, teacher).*

#### 3-1-2. Life destruction

The participants, especially the women, described the disaster as a phenomenon that leads to losing peace, homelessness, misery, pain, suffering and loneliness, deviation from the normal life, tragedy, and death of loved ones.

*"Wow! I am terrified of all crises and disasters. In my experience, an earthquake means disaster, homelessness, and being bereaved" (PN.13, mother).*

#### 3-1-3. Anxiety

Many participants, especially women, expressed feelings of anxiety and fear after the disaster, which were mostly related to getting stuck under rubble, homelessness, death, loss of possessions, fears about the recurrence of the disaster, and unknown future and destiny. Others pointed to feelings of helplessness and frustration after the disaster and the influx of negative thoughts about the consequences of the disaster.

*"I was still thinking about what would happen for several years after the earthquake; for example, If the earthquake happens again, and my mother and I would be under rubble" (PN.7, teacher).*

### 3-2. Essence of resilience

This category refers to perceptions and beliefs that were especially prevalent among participants following the experience of the Bam Earthquake. It consists of three subcategories related to the entity and essence of Resilience: "Resilience: a key to problem-solving", "Spirituality: the secret of resilience" and

"Emotion control: the cause of resilience in disasters".

### 3-2-1. Resilience: a key to problem-solving

In this case, participants in each group provided different descriptions for the concept of resilience. Some described resilience as endurance in the face of

disaster, as well as adapting to it, coping with its adversity, increasing the threshold of endurance in the face of adversities, returning to a normal life after a disaster, and not breaking up the life after a disaster. Others portrayed resilience as a strong string to sustain life, thanking God in all circumstances, or finding solutions to reduce the consequences of a crisis.

**Table-1:** Frequency distribution of baseline characteristics of participants.

Number	Participants	Age	Academic degree	Marital status	Occupation
1	PN1	36	Masters	Married	School principal
2	PN2	31	Bachelors	Single	Teacher
3	PN3	32	Bachelors	Married	School Associate
4	PN4	36	Bachelors	Married	School principal
5	PN5	30	Bachelors	Married	Teacher
6	PN6	34	Masters	Married	Teacher
7	PN7	30	PhD	Single	Teacher
8	PN8	32	Bachelors	Married	Teacher
9	PN9	34	Bachelors	Married	School Associate
10	PN10	34	Bachelors	Married	Health educator
11	PN11	36	Bachelors	Married	Housewife
12	PN12	33	Bachelors	Married	Housewife
13	PN13	32	High school	Married	Housewife
14	PN14	35	Bachelors	Married	Employee
15	PN15	35	Masters	Married	Housewife
16	PN16	31	Bachelors	Married	Employee
17	PN17	32	Intermediate	Married	Housewife
18	PN18	32	Bachelors	Married	Employee
19	PN19	36	Bachelors	Married	Housewife
20	PN20	33	Bachelors	Married	Housewife
21	PN21	35	Bachelors	Married	Housewife
22	PN22	33	PHD	Married	Employee
23	PN23	32	Bachelors	Married	Housewife
24	PN24	35	intermediate	Married	Self-employment
25	PN25	36	High school	Married	Farmer
26	PN26	34	Bachelors	Married	Self-employment
27	PN27	36	Bachelors	Married	Employee
28	PN28	36	Bachelors	Married	Self-employment
29	PN29	34	Bachelors	Married	Self-employment
30	PN30	36	Middle school	Married	Self-employment
31	PN31	35	Bachelors	Married	Employee
32	PN32	33	Masters	Married	Employee
33	PN33	36	Bachelors	Married	Self-employment
34	PN34	36	Bachelors	Married	Employee

**Table-2:** Codes, category and subcategory experiences of Adolescents' resilience

Category	Subcategory	Codes
Disaster consequences	<ul style="list-style-type: none"> <li>-Spiritual evolution</li> <li>-Life destruction</li> <li>-Anxiety</li> </ul>	<ul style="list-style-type: none"> <li>-Spiritual transformation, growing up, reaching evolution, being content and feel more satisfied in life, appreciating the blessings of well-being</li> <li>-Losing peace, homelessness, misery, pain, suffering and loneliness, deviation from the normal order of life, tragedy, and death of loved ones</li> <li>-Feelings of anxiety and fear after the disaster, stuck under rubble, homelessness, death, loss of other possessions, recurrence of the disaster, and unknown future and destiny.</li> <li>-Feelings of helplessness and frustration after the disaster and the influx of negative thoughts about the consequences of the disaster.</li> </ul>
Essence of resilience	<ul style="list-style-type: none"> <li>-Resilience: the key to problem-solving</li> <li>-Spirituality: the secret of resilience</li> <li>-Emotion control: the cause of resilience in disasters</li> </ul>	<ul style="list-style-type: none"> <li>-Resilience as endurance in the face of disaster, adapting to it, coping with its adversity, increasing the threshold of endurance in the face of adversities, returning to a normal life after a disaster, not breaking up the life after a disaster</li> <li>-Resilience as a strong string to sustain life, thanking God in all circumstances, finding solutions to reduce the consequences of a crisis.</li> <li>the effect of religious beliefs in increasing resilience, trusting in God to correct all problems, the effect of reciting the Qur'an, saying prayers, and sending Salawat in times of crisis to increase resilience and peace of mind, the earthquake disaster is a cause of purification from sin, disaster awakens misguided and ignorant people, disaster is a divine test</li> <li>- Emotion control was necessary to maintain the calming of others, to gradually resolve problems, to find appropriate solutions, to maintain family peace</li> </ul>
Beliefs about enhancing resilience	<ul style="list-style-type: none"> <li>-Awareness and skillfulness</li> <li>-Family efficiency</li> </ul>	<ul style="list-style-type: none"> <li>-Higher education, physical ability, mental ability, self-control skills, social skills, crisis resolution, learning first aids and flexibility in coping with each problem, resilience enhancement.</li> <li>-Trust in parents' ability to properly manage a crisis, the presence of the family as a supporter of its members' mental conditions in crisis</li> </ul>
Factors affecting resilience	<ul style="list-style-type: none"> <li>-Previous experience</li> <li>-Parents' gentility</li> <li>-Social status of the family</li> <li>-Place of residence</li> <li>-Personality</li> </ul>	<ul style="list-style-type: none"> <li>-Being prepared to deal with predictable disasters, finding appropriate solutions by reviewing previous experiences of dealing with a similar disaster individually, in family, or among friends, or relatives, the impact of counseling with survivors of any crisis.</li> <li>-Raising independent children with high decision-making skills, not dependent and weak-minded children with low tolerance</li> <li>-Living in less affluent families or lower socioeconomic status and large families increased resilience</li> <li>-The impact of living in less privileged, small, and accident-prone areas on enhancing resilience</li> </ul>

	<ul style="list-style-type: none"> <li>-Intelligence</li> <li>-Age</li> <li>-Gender</li> <li>-Extent of the damage</li> </ul>	<ul style="list-style-type: none"> <li>-Being extrovert and cool would increase resilience while being sensitive or introvert may reduce resilience</li> <li>-High intelligence would reduce disaster risk and help to adapt to the effects of a crisis by enhancing the ability to find various solutions.</li> <li>-Higher levels of resilience in older people due to their stronger ability to analyze problems, greater tolerance, and more experiences</li> <li>-Higher resilience in girls due to greater adaptability, higher resilience in boys due to greater physical strength and a more rational approach to issues</li> <li>-The severity of physical injuries, financial losses, disruptions of everyday life activities, injuries of loved ones</li> </ul>
Reaction to disasters	<ul style="list-style-type: none"> <li>-Hope to solve problems</li> <li>-Taking action for solving problems</li> <li>- keep calm : the key to control critical situations</li> <li>-Being passive and waiting</li> <li>- deny and escape from the reality</li> <li>-Vain belief in patience</li> </ul>	<ul style="list-style-type: none"> <li>-Resilience and situation amendment, correcting problems over time, human hope to live, having patience and enduring problems, helping others to solve problems, temporal difficulties, the emergence of peace after every hardship, thinking about worse situations, focusing on resources, believing in amendments, and gradual improvement of the situation after each crisis</li> <li>-Trying to find solutions for potential problems, consulting with experienced people, consulting with experts of crisis management or psychologists (if available) and relying on their talents and creativity to solve the problem</li> <li>-Controlling critical situations especially in disasters; calmness helps making wise decisions, control situations, and prevent others from panic attacks</li> <li>-Sitting down and asking for help from those around them, waiting for others to find a solution, waiting for the arrival of the first responders, asking for help from God, and the holy people (Imams) as coping strategies</li> <li>-Escaping from current problems, denying reality, being careless, not thinking about the future</li> <li>-The effectiveness of patience, not rushing to improve the situation, patience and composure without any special action, solving problems over time, the temporary nature of the problems, and the lack of need to do anything</li> </ul>
the necessity preparedness for disasters	<ul style="list-style-type: none"> <li>-Teaching the proper interactions in a crisis</li> <li>-Obtaining information about disasters from various sources</li> </ul>	<ul style="list-style-type: none"> <li>-Individual and social skills related to fostering creativity and problem-solving skills, to the need to strengthen students' spirit of altruism and cooperation in critical situations, the importance of self-devotion, recognizing and improving individual abilities, positive thinking, increasing self-confidence and self-reliance, and inform them about the immoral nature of taking pictures and videos in critical situations instead of helping</li> <li>-Having general information about disasters and ways to reduce the risk, watching videos with a crisis theme, and interacting with earthquake-stricken families</li> </ul>

*"Experience has shown me that the key to solving any problem or crisis is to have resilience. It means to be patient, to endure hardships and help yourself to get back to normal" (P.13, mother).*

### **3-2-2. Spirituality: the secret of resilience**

Some participants, especially teachers and mothers, who were older at the time of the earthquake, pointed to the effect of religious beliefs in increasing resilience, trusting in God to correct all problems, the effect of reciting the Qur'an, saying prayers, and sending Salavat on prophet (Peace be upon the Prophet Muhammad and her family, which is common among Muslims) in times of crisis to increase resilience and peace of mind. Others had a spiritual view of the crisis, and after experiencing the earthquake, they came to believe that a disaster is a cause of purification from sin, it awakes misguided and ignorant people, or it is a divine test.

*"Unfortunately, the children's faith has weakened now; otherwise, I remember, sir, my grandmother in those days continuously said prayers as well as salavat and peace on the prophet or studied the Qur'an specially Ayat Al-Kursi for a hundred times. These will undoubtedly make a miracle for the individual's calming" (PN.23, mother).*

### **3-2-3. Emotion control: the cause of resilience in disasters**

Several participants, especially fathers, after experiencing the Bam earthquake concluded that emotion control was necessary to maintain the calming of others, to gradually resolve problems, to find appropriate solutions, and to maintain family peace.

*"My experiences have made me believe that when a problem, crisis, or disaster occurs, it is important to control your emotions to think better and find a solution" (PN.25, father).*

## **3-3. Beliefs about enhancing resilience**

Many participants believed that awareness, skillfulness, and family efficiency are the factors which make individuals more resilient.

### **3-3-1. Skillfulness and awareness affect resilience**

Participants stated that the earthquake made them accept that higher education, physical ability, mental ability, self-control skills, social skills, and crisis resolution skills, along with learning first aid and flexibility in coping with problems during life can enhance peoples' resilience.

*"After the earthquake, people who survived healthy returned to normal life faster than those who experienced physical or mental diseases, like spinal cord amputation (After a second) Indeed, some of them have not yet adapted to these conditions" (PN.3, teacher).*

### **3-3-2. Family efficiency and resilience**

Some participants believed in the effect of family performance on resilience. They mentioned the ability to trust in parents for properly managing a crisis and the presence of the family as a supporter of members' mental conditions in crisis as factors influencing the children's resilience.

*"I lost my family in the earthquake, but this experience proved it to me that having a family is a great blessing. The family is the biggest supporter of a person" (PN.12, mother).*

### **3-4. Factors affecting resilience**

Many participants suggested that several factors affect resilience, including previous experience, parents' gentility, and social status of the family, place of residence, personality, gender, age, and extent of the damage.

### 3-4-1. Previous experience

Almost all the participants asserted that previous experiences can help one in being prepared to deal with predictable disasters. They pointed to conditions such as finding appropriate solutions by reviewing previous experiences of dealing with a similar disaster in themselves, family, friends, or relatives; and emphasized on the impact of counseling with survivors of any crisis.

*"Nothing replaces the experience. I remember our neighbor had already experienced the earthquake in their village in the north of the country, she was telling us what to do, how to help others, how to share supplies and food" (PN. 22, mother).*

### 3-4-2. Parents' gentility

In this regard, the participants believed that parents have a major influence on their children's resilience. In fact, they can raise independent children with high decision-making power, or dependent and weak-minded children with low tolerance.

*"In the Bam earthquake, children who had been trained independently and firmly could endure hardship, malnutrition and cold weather. But dependent and spoiled children had no endurance. They bothered both themselves and others very much" (PN. 25, father).*

### 3-4-3. Social status of the family

Some noted that living in less affluent families or lower socioeconomic status and large families increased resilience.

*"I was almost an adult when the earthquake occurred, and I really found out there that my friends and those around me who had grown up in deprived families were more tolerant. They had learned to adapt the situation without grumbling" (PN. 9, teacher).*

### 3-4-4. place of residence

Participants believed that living in less privileged, small, and accident-prone areas

can have positive impacts on resilience enhancement.

*"Two of our neighbors, who lived in the village until a few years ago and had once experienced a flood, coped much better with the situation" (PN. 27, father).*

### 3-4-5. Personality

It was manifested to some participants that being extrovert and cool would increase resilience, while being sensitive or introvert may reduce resilience.

*"My husband and I are both introverts. Introverted people adapt too late because they do not express their feelings and hide everything from others or do not seek help from anyone, like us after the earthquake", said a teacher of a females' school with 20 years of experience" (PN. 8, teacher).*

### 3-4-6. Intelligence

Some believed that high intelligence would reduce disaster risk and help to adapt to the effects of a crisis by strengthening the ability to find various solutions.

*"Actually, sir, what we see in working with children and our experience during the earthquake is that those who are smarter can solve problems much more easily, or at least, cope with them" (PN.4, teacher).*

### 3-4-7. Age

Participants had different experiences of this subcategory. A number of them believed in higher levels of resilience in older people due to their stronger ability to analyze problems, higher tolerance, and more experiences but they thought that resilience may decrease in the elderly.

*"Adults are more tolerant. My cousin, who was 18 years old at the time of the earthquake and lost three of her sisters or my sister, who was 17 years old at that time and lost her best friend, better adjusted and returned to normal life sooner than the younger people I knew, who had lost a loved one " (P.20, mother).*

### 3-4-8. Gender

Participants also had different ideas about the effect of gender on resilience. Some pointed to higher resilience in girls due to greater adaptability, and some to higher resilience in boys due to greater physical strength and a more rational approach to issues.

*"People's endurance depends on their gender. Can men and women alike endure hardships? Certainly not. Men are more tolerant because they have more physical strength" (PN. 7, teacher).*

*"It is true that men have more physical strength, but women, especially women of this area, are very tolerable. During the earthquake, many families, especially children, would be exhausted if women were not there to manage the situation" (PN. 28, father).*

### 3-4-9. Extent of the damage

Participants in different groups stated that resilience depends on the severity of physical injuries, financial losses, disruptions of everyday life activities, injuries of loved ones.

*"In the earthquake, those who did not lose a loved one returned to their previous life much faster. On the contrary, some hot-eyed people are still afraid of the name of the earthquake" (PN.13, mother).*

### 3-5. Reaction to disasters

In this category, there were six subcategories, including the hope to solve problems, taking action for solving problems, keeping calm as the key to control critical situations, being passive and waiting, denying and escaping from the reality, and vain belief in patience.

#### 3-5-1. Hope to solve problems

Most participants hoped to solve the problems after the crisis. In other words, they believed in the effectiveness of resilience; and had positive thoughts about situation amendment, correcting problems

over time, human hope to live, having patience and enduring problems, helping others to solve problems, temporal difficulties, and the emergence of peace after every hardship. A number of participants believed that by thinking about worse situations, focusing on resources, believing in amendments, and gradual improvement of the situation after each crisis, one can hope to solve problems.

*"Humans are alive with hope. Life has proven to me that when an earthquake, a flood, or any other problem occurs, we must hope and wait" (PN. 6, teacher).*

*"It is mentioned in the Quran that after every difficulty, there is ease. Whenever I experience a problem, I repeat this verse with myself" (PN. 30, father).*

#### 3-5-2. Taking action for solving problems

A number of participants expressed issues such as trying to find solutions for potential problems, consulting with experienced people, consulting with experts of crisis management or psychologists (if available) and relying on their talents and creativity to solve the problem.

*"After the earthquake, I came to the conclusion that there is a solution to every problem. You have to look and find a solution, no matter if this is a low score on the exam or loss of property after an earthquake" (PN. 27, father).*

#### 3-5-3. Keep calm: the key to controlling critical situations

A number of participants emphasized keeping calm to control critical situations, especially in disasters, and concluded that calmness helps to make wise decisions, control situations, and prevent others from panic.

*"I try to keep calm in order to make a wise decision in unusual circumstances.*

*Confusion and haste are the devil's actions and will not have a positive result" (PN. 31, father).*

### **3-5-4. Being passive and waiting**

In particular, the women mentioned sitting down and asking for help from those around them, waiting for others to find a solution, waiting for the arrival of the first responders, asking for help from God, and the holy people (Imams) as coping strategies.

*"Whenever I have a problem, I only mention God, I call Hazrat Fatima and wait for help" (PN. 3, teacher).*

### **3-5-5. deny and scape from the reality**

Escaping from current problems, denying reality, being careless, and not thinking about the future were ways to react to the consequences of the disaster.

### **3-5-6. Patience without any attempts**

Some participants mentioned the effectiveness of patience, not rushing to improve the situation, patience and composure without any special action, solving problems over time, the temporary nature of the problems, and the lack of need to do anything.

*"Patience is very important. Sometimes struggling makes things worse. I am especially careless in the face of unbearable problems and just wait" (PN. 16, mother).*

## **3-6. The necessity preparedness is disasters**

In this category, issues such as the need to teach proper interactions during a crisis and to obtain information about disasters from various sources were expressed.

### **3-6-1. Teaching the proper interactions in a crisis**

Some participants pointed out that students should learn necessary skills during a crisis including individual and social skills related to fostering creativity and problem-

solving skills. They also referred to the need to strengthen students' spirit of altruism and cooperation in critical situations, the importance of self-devotion, recognizing and improving individual abilities, positive thinking along with increasing self-confidence and self-reliance; and they should be informed about the immoral nature of taking pictures and videos in critical situations instead of helping.

*"People should be trained about dealing with critical situations, for example, they should know that taking photos and videos instead of helping the sufferers is completely immoral" (PN. 4, teacher).*

### **3-6-2. Obtaining information about disasters from various sources**

Some of the participants proposed that having general information about disasters and ways to reduce the risk, watching videos with a crisis theme, and interacting with earthquake-stricken families will have a positive effect on resilience and learning ways to reinforce it.

*"Some movies have crisis related themes. I watch such movies a lot. For example, there is an earthquake and the whole movie shows how people adapt to the conditions and continue their lives" (PN. 32, father).*

## **4- DISCUSSION**

The present study explored the experiences of the Bam earthquake survivors who were in their adolescence at that time and their perceptions towards resilience against disasters using the content analysis method. We summarized our findings into 6 categories: disaster consequences, beliefs about resilience, beliefs about enhancing resilience, factors affecting resilience, consequences of facing disasters, the necessity of preparedness for disasters.

They pointed to different positive and negative experiences from mental

evolution to extinction in life after the disaster. Similar studies have reported different results. Some studies have defined "disaster" as a tragic event that threatens human life and causes physical harm and mental stress and reported that people after experiencing a disaster may experience depression, death anxiety, panic disorder, and phobias (25). But several studies look at disaster and crisis as an evolutionary factor and have emphasized positive changes such as valuing life, improving interpersonal relationships, improving performance, and deepening the meaning of life after a crisis (26). Thus, the participants' expressed experiences have been influenced by their attitudes, the effects of the disaster, and their coping skills.

Most participants signified the emotional control and spirituality as effective factors in resilience reinforcement. Similar studies have identified resilience as controlling negative emotions; and have suggested methods such as drawing, writing, thinking aloud, and talking to experts as ways to increase resilience (27).

Others have emphasized the role of spirituality in supporting resilience by modulating stress, promoting health (28-31), and the concept of self-worth (32), creating peace (33), and a way to adapt to adversities after the disaster, and it is confirmed that it promotes the older adults' strength, and helps them in redirecting their lives via a connection with the divine (28).

Many participants after the Bam earthquake realized some important factors affecting people's resilience in difficult conditions. Similar studies have verified several of these factors such as having social support (28, 34), warm and supportive family (35- 37), high individual and family education (38), former awareness and preparedness for predictable disasters like earthquakes (39), high intelligence (40, 41, 42), the internal

control center, personality traits such as extroversion (31, 37) and knowing communication skills (37, 43) and life skills (37, 44).

One of the factors abstracted in this study, which according to the participants had a significant effect on resilience, was the severity of human and financial losses of the victims. In fact, it was mentioned that those who were more physically and financially injured in the Bam earthquake, could later commence normal life. Some scholars have confirmed this by reporting that victims who lost their families, relatives, or friends returned to natural every-day life later and had weaker adaptations compared to those who just suffered financially (45). It can be attributed to the fact that financial loss is compensable but lost ones never come back to life.

Many participants acknowledged the significant impact of the experience on dealing with crisis and resilient coping, calling it (28, 36, 41) as the key to disaster preparedness (46). Numerous studies have emphasized this point and even Rafiey's theory of inoculation shows that previous experience with one type of disaster strengthens resistance against other hardships and reduces the negative effects of the disaster in life (47). Experience manifests a tested solution, saves the individual's time and energy to adapt, and assures him/her that the crisis is temporary.

Resilience, then, is a person's confidence in his ability to overcome stress and to cope (14, 37). It has been mentioned as one of the protective factors against future risk factors (48).

In the category of "Necessity of preparedness for disasters", especially the parent participants emphasized the impact of education. Previous research has confirmed this finding and pointed to the role of developing communication and

social skills in enhancing the self-efficacy in adaptive strength (44). On the other hand, participation in training courses or crisis maneuvers increases preparedness for crisis management (49). Also, training about disaster bolsters readiness by correcting perceptions of risk and developing a social capital (46). The Hyogo' framework for Action (2005-2015) emphasizes readiness and training to create resilience and a culture of safety at all levels, (50,51) while the Sendai Framework DRR (2015-2030) focuses on youth participation in risk reduction and considers it as an important resource (52).

In the category of "Response to a crisis", participants' experiences ranged from tolerance and resilience against the disaster to crisis denial, helplessness, anger, and fear, which was acknowledged by previous scholars. Denial means not accepting the danger and its possible consequences (27) and given some pieces of evidence, it is the first reaction of a person to a disaster that does not allow anxiety to reach the level of consciousness (26).

Timalsina and Songwathana consider fear, anxiety, and panic to be the usual emotions in response to ambiguous and potentially dangerous situations (28). Numerous studies report that various factors affect responses to a crisis, including individual factors like age, gender, education, race, social factors, access to resources (16,36), and the social culture and level of education in relation to some coping strategies (53).

#### **4-1. Limitations of the study**

The most important limitation of this study was its subject, which was reminiscent of the hard days of the earthquake for the participants. In fact, it sometimes diverted the participants from the interview and wasted time since the researcher had to use communication skills to adapt to the atmosphere and help the participants to continue the interview.

## **5- CONCLUSION**

In the present study, we interviewed the Bam earthquake survivors who were in their adolescence at that time and we were informed from their opinions and experiences about their resilience strategies against disasters. These experiences were divided into 25 sub categories and 6 categories as follows: disaster consequences, beliefs about resilience, beliefs about enhancing resilience, factors affecting resilience, consequences of facing disasters, the necessity of preparedness for disasters. In this study, they shared numerous experiences about the individual, family, and social effects of earthquakes on their lives. They also talked about beliefs they developed about resilience and the factors that enhanced or reduced it, and in particular, experiences that emphasized the necessity of preparedness for coping with disasters. In this study, the survivors of the Bam earthquake expressed different positive and negative experiences, which on the one hand, indicated their bitter experience; and on the other hand, it showed that the main focus of the government and policymakers in natural disasters, including earthquakes, is to solve problems during a crisis. While it is suggested that crisis management officials, on the one hand, should take measures to prepare people for a disaster before its occurrence, such as public education on crisis management, disaster risk reduction, ways to deal with stress, increase adaptation, the introduction of various sources of information, showing relevant videos, and making interviews with consultants and experienced people to reduce problems in the case of crisis and to reinforce survivors' adaptability and resilience. On the other hand, after a major disaster like the Bam earthquake, it is necessary for the victims to have governmental support for at least several years to strengthen their physical and

mental conditions and to learn how to deal with problems, since it helps them to begin their normal lives faster.

**6- Conflict of Interest:** None.

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