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ORIGINAL ARTICLE

Disaster Mitigation and preparedness from the Perspective of Holy Quran

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A B S T R A C T

Background: Different religions have tackled the issue of natural disasters, considering them the result of people's sins, holy action, and tools used by God to punish people. These beliefs will keep people reluctant to do anything to respond well to disasters since they believe that nothing could or should be done. Of course, the Holy Quran advises believers to stay cautious about disaster risks and try to lessen them. Thus, this research aims to investigate the verses of the Holy Quran about disaster risk management to correct religious beliefs about this topic.

Methods: A qualitative study was conducted. First, verses of Holy Quran related to disasters were identified through a search in Quran's text, translation, and interpretation. Data were analyzed using qualitative content analysis.

Results: 82 of verses were included in the analysis after evaluating their content. The results were divided into two categories: readiness, and prevention and vulnerability reduction.

Conclusion: This research confirms that Islam has paid much attention to disaster readiness and prevention. This issue has been stated in Holy Quran with many examples and suggestions. Precise reflection in these verses can have a notable influence on changing the views and beliefs of society members, and these verses are proof of the policies, actions, and plans that humanity has reached after years of experience against hazards.

Keywords: Disaster, Mitigation, Preparedness, Holy Quran

Introduction

There are different beliefs concerning the occurrence of disasters and different ways for responding to them. These ideas and fallacies have existed from centuries ago till now. Many civilizations link natural disasters to their religion and God (1). Due to the importance of linking science to religion, several studies have highlighted the relation between religion and disaster risk management (2, 3). Moreover, in December 2009, World Parliament of Religions organized an association called Faith, Community, and Disaster Risk Reduction (4). Different religions have tackled the issue of natural disasters, and considered them the result of people's sins, holy action, and tools used by God to punish people (5-7). As an

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illustration, the majority of individuals in Bangladesh, who adhere to Islam, perceive floods as "the act of God". They consider that God caused this flood and will guard his servants. These beliefs will keep people from preparing well for disasters since they believe that nothing could or should be done. This misunderstanding and lack of awareness about disasters will lead to inadequate disaster preparedness and devastating results (8). The attribution of hazards to God or religious beliefs can contribute to increased vulnerability to disasters. This association may result in misunderstanding of disaster risks, and hindering prevention efforts and enhancing readiness (6, 9). There is a common interpretation among various religions that disasters are "God's will/action" or "divine punishment" (6, 7). A study conducted in Saudi Arabia showed that people consider that everything is under God's control, including natural disasters, which are God's punishment to people. They believe that the story of Noah's ark, in which flood occurred, is God's punishment as described in Quran ,and creating the ark was a way to stay safe (10). Another study examined the role of Christianity, Buddhism, and Confucianism regarding hazard risk management in Korea. It concluded that communication and collaboration between disaster management organizations and religious organizations are indispensable (11). Quran, the holy book of Muslims, is divided into 30 parts (Joz'e), 114 chapters (Surah), and 6236 verses (Ayat). Scientists believe that Holy Quran contains numerous scientific truths (12). One of the recurrent themes in Quran is natural disasters, including earthquakes, floods, droughts, and storms (5). Even in the Holy Quran, the cause of death is attributed to various diseases and events such as earthquakes (13). As mentioned above, the factors of preparedness and damage reduction in disasters are influenced by individuals' religious understanding. However, search results indicated that, to date, no research has been conducted with the aim of analyzing the content of Quranic verses regarding preparedness, prevention, and mitigation of disasters. Therefore, Quranic perspective in this regard is valuable and can provide relevant information for acquiring readiness, monitoring, and reducing damage in the face of disasters. The aim of this study is to examine and determine Quranic verses related to the concepts of preparedness, prevention, and damage reduction in the face of disasters, aiming to present a foundational and religious perspective from the viewpoint of Holy Quran.

Materials and Methods

Data Gathering

This research has been conducted using a qualitative content analysis approach. Qualitative content analysis is a method of interpreting mental content of textual data through systematic categorization, coding, and creation of recognized patterns (14). Choosing qualitative content analysis in this study was rooted in the non-material and spiritual nature of the content, with the goal of uncovering meaning and enhancing understanding of the contents of Holy Quran. In the initial phase of this study, researchers delved into the perspectives of Abrahamic religions (Islam, Christianity, and Judaism) regarding disaster management through a comprehensive literature review. After that, experts in disaster health and Quranic sciences recommended further keywords in the search strategy to find more elements related to hazards from Holy Quran. The words included disasters, emergencies, risks, hazards, earthquakes, floods, storms, droughts, famines, preparedness, news, warnings, incident, lesson learned, storage, safety, and training. Following that, these keywords were searched in Persian within the translation texts of the Quranic exegeses and translations of the Quran on online platforms, including Tebyan Cultural Institute website and Pars Quran website(15, 16). To ensure that precise verses were chosen, the extracted keywords were translated with the help of two religious experts fluent in Arabic, the language of the Quran. The search was done again using the website of the King of Saudi Arabia University, which translated online Quran into all languages (17). Finally, to understand the content of the extracted verses, two religious scholars, fluent in Arabic and experts in

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the translation of the Quran, were interviewed. The points of disagreement among these experts were referred to a third scholar who held a higher academic degree (PhD in Quranic Sciences) for resolution.

Data Analysis

Data were analyzed using a content analysis approach. It is a process for identifying, analyzing, and reporting themes within the text and is extensively used in qualitative data analysis (18). Data were coded by two researchers. The researchers followed six main steps to conduct the analysis: a) Reading the meaning of the derived verses several times to be familiar with the data; b) Identifying and extracting disaster concepts in the verses; c) Classifying the extracted verses; d) Categorizing verses in disaster-related themes; e) Naming themes; f) Achieving consensus between two researchers regarding final themes and sub-themes. Data rigor was achieved by peer check and getting familiar with the data (consistency) (19) .

Rigor

The credibility of the study was confirmed using keywords in Persian and Arabic versions of Quran, searching translation of verses and different interpretations to identify further verses related to subject, and searching for verses in the translation and interpretations of several people. Peer review was another way to obtain data acceptance, hence, the content of the conclusions was confirmed by two experts in Quranic sciences and a health disasters expert.

Results

It was found that 667 verses of the Holy Quran contained the previously mentioned keywords. 82 of them were included in the analysis after evaluating their content. The results were divided into two categories: readiness, and prevention and vulnerability reduction. These categories were divided into subcategories. Finally, a total of 14 subcategories/ subclasses related to the research question were obtained (Table 1).

Table 1. Classes, subclasses, and verses related to disasters

Class	Subclass	Surah and Ayat
Preparedness	Alertness	Al-An'am (31)
	Planning	Al-Baqarah (180) Al-Ma’idah (106) Al-Hashr (18)
	Emergency storage	Hud (37 and 38) Al-Mu'minun (27) Yusuf (46 to 48)
	Early warning system	Ash-Shu'ara' (208) Hud (37, 38, 40 Ta 42) Yusuf (46 to 48)
	News confirmation functions	Al-Hujurat (6)
	Following the principles of command and hierarchy	An-Nisa (59) Al-Baqara (247) Al-Hujurat (1)
	Hazard identification (storm)	Al-Ankabut (14) Al-Dhariyat (41) Al-Haqqah (6) Fussilat (16) Surah Al-Qamar (19)
	Hazard identification (drought)	Al-Baqara (155), Al-A'raf (130), Nahl (112) Yusuf (43 to 49)
	Hazard identification (earthquake)	Az-Zilzaal (1 and 2), Al-Muzammil (14), Al-Hajj (1), Al-A'raf (73, 78, 91, 155), An-Nahl (26), Al-Isra (68, 37), Al-Ankabut (37)
	Hazard identification (flood)	Al-Mu'minun (18), Ar-Ra'd (17), Al Anfal (54), Saba (15, 16, 17)
	Dam building	Al-Kahf (92 to 98)
Prevention and Vulnerability Reduction	Identifying and helping the vulnerable groups	Al-Duha (6) Yusuf (12)
	Learning lessons from previous disasters	Al-Sajdah (26) Saba (19), Taha (128), Hud (120) Yusuf (111) Al-Qamar (51), Al-Naza’at (26), Al-Haqqah (12) An-Naml (52) Al-Hashr (2) Ibrahim (45) Yusuf (45) 7), Ash-Shu'ara' (139, 121 and 190), al-Hijr (75 and 77)
	Behavior change and self-care in disasters	Al-Shura (30), Al-Nisa (79), Al-Baqara (195), Ar-Ra'd (11) Al-Anfal (53), Yunus (44), Hud (117)

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Discussion

Prevention, preparedness, and vulnerability reduction were the approaches identified during the analysis, which are the most common terms in the field of disaster management. Holy Quran highlights the need for readiness, prevention, and disaster risk reduction. Planning is the pillar of readiness for disasters. Planning for disasters was first mentioned by Dynes, Quarantelli, and Kreps in 1972 (20), which was the first study conducted about this issue. After that, many scholars elaborated on this topic (21-23). US Federal Government established the Federal Emergency Management Agency (FEMA) and ratified Emergency Planning and Management Act in 1803. In 1996, FEMA defined Emergency Operations Plan a record that addresses the duty of organizations and people to take action at a specific time and place during an emergency (worst-case scenario) (24). One of the difficulties anyone might face in life is the death of beloved ones, mentioned in verses 180 of Surah Al-Baqarah and 106 of Surah Al-Ma'ida. These verses recommend planning for the aftermath of one's death (worst-case scenario) and organizing actions for circumstances that might occur. More than 1400 years ago, Holy Quran asked humans to plan for post-mortem emergencies before any agency was created and when there wasn't any scientific proof of emergency planning or worst-case scenario management. The two other verses with regard to planning are verse 18 of Surah Al-Hashr and verse 200 of Surah Al-Imran, which advise people to be ready before any dangerous situation occurs. Furthermore, verse 131 of Surah Al-An'am emphasizes the importance of preparation, alertness, and avoidance of carelessness regarding disasters: "... Your Lord is not tormentful and would not destroy the countries while their people were unaware (unwarned) ..." Possibly one of the reasons for this oversight is that most pre-disaster functions are predictive and tentative. One of the difficulties in disaster preparation is determining the demands and needs of people in both response and recovery phases (25), and supporting disaster relief missions is the most expensive part of the emergency period (26). These factors lead disaster risk administrators and decision-makers to overlook logistics during disasters. Quran considered that logistics is a critical step in preparing for disaster response. In verses 37 and 38 in Surah Hud and verse 27 in Surah Al-Mu'minun, Noah has been ordered by God to create an ark. While he was building the ark, people used to pass by and make fun of him since he was building it in an arid desert. Another chapter of the Qur'an that speaks about supply chain management in emergencies is verses 46 to 48 of Surah Yusuf. These verses ensure that planning and storage are vital during disasters and that these efforts will protect the nation from dire distress. Several disaster risk managers' logistics plan is similar to that of Prophet Yusuf (as). On the other hand, managers who are not aware of the importance of logistics in emergencies are similar to those who derided Noah for creating the ark in the desert.

In Qur'an, the early warning system is stated (5), the scheme and deployment of which is one of the most critical aspects of emergency management. According to the World Health Organization (WHO), this is the first action to be done in disaster response planning (27, 28). This concept was found in five verses of Surah Hud 37, 38, 40, 41, 42. These verses refer to subjects such as the order to Noah to build the ark, the command to Noah and his followers to board the ark, and the warning of a flood. There is similarity between flood alerts in Noah's day and the warnings of imminent natural disasters in modern world (29). Another danger discussed several times in Qur'an is aridity and famine. Drought is a natural hazard with a slow onset. This disaster is the most harmful natural disaster, which affects many populations (30), (31, 32). Starvation is the most visible result of drought (33-35) . In recent years, several indicators have been introduced to predict drought. For instance, the Palmer Drought Intensity Index was first designed in 1965 to predict this risk (36). In 1967, Rainfall deciles were designed as drought indicators (37). Furthermore, in 1968, CMI (38), BMDI(39), SWSI(40), SPI (41), and EDI (42)

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were developed. The international community has also used Famine *Early Warning* Systems Network (FEWS) to anticipate and counter future food crises in Sudan and Ethiopia since the mid-1980s (43). This volume of indicators for foretelling drought and scarcity reveal that, according to the properties mentioned above, it is possible to predict and alert in time before the event of these disasters (44).

One of the virtues of the Holy Quran is that among disasters and events that it exemplifies, only early predictions regarding droughts and famines are discussed. In verses 46 to 48 of Surah Yusuf, Quran alerts against early climate change and states that in the next seven years, it will be raining, there will be agricultural burgeon, and people should stockpile in these years. Furthermore, it mentions that after these years, drought will occur, and people will have to use what they have already stored. Indeed, God considers that early warning of disasters and the predictability of some hazards, including drought, is essential. The first aridity forecasting tool was designed in 1965 (36). In verse 6 of Surah Al-Hujurat, Holy Quran stresses on the importance of paying attention to reliable and verified news and the outcomes resulting from relying on unreliable ones. Confirmation and diffusion of news from disaster warning system is the final criterion for disaster response activation program by accountable authorities(45). In other words, this verse can be referred to as the "confirmation of news" verse, which is one of the critical functions regarding disaster management. When emergencies occur, data and information might be insufficient, inadequate, and inaccurate; many organizations will be involved in the response phase; inexperienced people rush to the scene; and there will be very limited time to take decisions. That is why it is essential to manage these scenes with powerful effective administration (27, 46). God declares in Surah An-Nisa ', verse 59 that absolute obedience is to God and His Messenger, as well as to those who are "rightfully in charge." This verse highlights the call for subjection of subordinates to commanders in unique scenes such as war, dispute, and hazards. Furthermore, Surah Al-Baqarah, verse 247, points out the urgency of electing a commander with the required knowledge and ability. When people asked about the reason for this choice, Quran explicitly declares that the knowledge and physical ability (proficiency) are basic criteria for choosing the commander (Saul). Surah Al-Hujurat enumerates many managerial points. Verse 1 of this surah says, "O you who believe, do not surpass God and His Messenger"; the point of this verse is the value of the hierarchy of command and following the commander's orders. Hence, the hierarchy of command and the incident administration system obedience, which removes the conflict between the managers of the incident (47) is stated in the Qur'an.

In several chapters of the Holy Quran, recognizing the hazards and assessing them were considered the most vital and fundamental function for disaster readiness. Overall, it can be assumed that God has identified hazards and assessed them. Holy Quran reports the disasters that will happen continuously on earth (hazard profile or risk statement). Accordingly, emergency managers need to assess potential natural and man-made hazards (48). Recognizing the possibility of dangers reinforces preparation. It is important to note that rcent statistics from the Centre for Research on the Epidemiology of Disasters (CRED) show that floods, earthquakes, storms, and droughts are the most common disasters affecting ma people worldwide (49). These four hazards were regularly highlighted in Holy Quran in various verses more than 1400 years ago. By stating the disasters that have the highest frequency with the most affected population, God in Holy Qur'an wants to draw attention of human beings and societies. It is one of the miracles of Qur'an that before the establishment of geological sciences and natural hazards research and statistical centers in the field of emergencies, God pointed out in the Quran the hazards that will happen on earth. Despite the efforts by different organizations to better prepare people for disasters, studies revealed

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that people overlook readiness for natural disasters (50-52). Although, the main work of companies and institutions is to change public laws and policies, these actions cannot change society's views and beliefs. However, religions have the moral authority and institutional power to enable them to change society's attitudes, practices, and public policies (53). Another approach concluded from Qur'an is preventing and mitigating hazards during emergencies. Following this approach, measures should be taken to prevent disasters or lessen their damage. For example, the most practical and essential measure to prevent and diminish the risk of water leakage is "dam construction". The Holy Quran in Surah Al-Mu'minun verse 18, Surah Raad verse 17, Surah Al-Anfal verse 54, Surah Al-Hijr verse 21, and Surah Saba verses 15, 16, 17 points out the affected people in the flood. Qur'an identifies the lessons learned by these people regarding building dams to control floods and declares that people were able to utilize rainwater and great flood for the expansion of the city by building a dam. Likewise, in verses 92 to 98 of Surah Al-Kahf, Qur'an describes the construction of the dam by "Dhu al-Qarnayn." Another measure quoted a lot in Qur'an to mitigate the damage in disasters is to use the experiences and lessons of earlier situations. Recent decades of research have led the National Research Council in Washington, D.C., in 1991 to suggest a collection of information about the physical, biological, social, health, and managerial aspects of disasters to be translated in policies and practices to lessen the impact of coming disasters. Disasters provide valuable information, resulting in policies and practices which can mitigate the risk of the loss of life, property, and natural resources in future incidents (54). One of the measures to overcome the effects of disasters is takeing into consideration the vulnerable groups in emergencies (55). Children are the most vulnerable (56), the most defenseless population in society (57). Hence, meeting the needs of children as a private duty of parents and a public duty of society has been emphasized and advised by God. In verse 6 of Surah Al-Duha, God states the need for children to enjoy a fitting place of comfort and tranquility and reminds the Prophet that despite adverse conditions, such requirements (a suitable place of comfort and tranquility) for him (the Prophet) was provided in childhood. Qur'an orders in verse 12 of Surah Yusuf to render tools and toys and to play with children. These actions are children's natural need. Verse 12 of Surah Yusuf stresses the need to take care of children against any threat and accident as a basic need. The Holy Quran speaks about the vulnerability of children before, during, and after emergencies. Scientists began studying about children's responses to troubles in 1940s, and these studies progressed slowly. So, approximately half of the studies about children and disasters have been published after 2010. They all identify children as the most helpless group, and state the urgent need for considering them in disaster planning (58). These pieces of evidence prove that Quran's opinion is different from that of the pre-Islamic religions, which considered hazards to be the punishment and fury of the Gods ("Acts of God"), and that humans can't control their harmful effects (59). It is stated in verse 89 of Surah An-Nahl, "We have sent down to you the Book; so that the truth of everything may be clarified...". Quran emphasized human beings protect themselves and the environment (60), and Surah Al-Imran explicitly calls all human beings to think about the well being of this world (61). On the other hand, in different verses of Holy Quran, the cause of disasters is related to human behavior and action, and emphasizes the role of human activities, self-care, and behavioral modification to prevent and reduce vulnerability; some of these verses are reviewed as the following: verse 30 of Surah Ash-Shuraa: "Every calamity befalls you because of your deeds"; Verse 79 of Surah Al-Nisa ': "All good that comes to you is from God, and every evil that comes to you is from yourself": Verse 195 of Surah Al-Baqarah: "Do not damage yourselves with your own hands, and do not endanger yourself"; Verse 11 of Surah Al-Ra'd: "Indeed, God does not change the destiny of people until they change their destiny"; Sura Al-Anfal, verse

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53: "This [severe punishment] is because God does not intend to change the blessings he has bestowed on people, until they change what they have in themselves; and surely God is All-Hearing, All-Knowing"; Sura Yunus, verse 44: "God never wrongs people, but people wrong themselves." Surah Hood, verse 117: "God does not intend to destroy any people of the land if they are righteous." Furthermore, no profession (hadith) from the Prophet Muhammad (pbuh) has been mentioned so far to declare that earthquakes or other natural hazards are due to God's wrath or the consequence of disobedience. Recently, religions have been accepted by non-Muslim scientists and researchers as a source of emotional and social support in the face of hazard (62). Indeed, the collaboration of disaster managers with religious administrators promotes readiness and decreases risks in communities.

Conclusion

This study displays the view of the Holy Quran about hazards. However, this study does not claim to have mentioned all the dimensions of disaster management from the perspective of Quran. This research confirms that Islam has paid much attention to disaster readiness and prevention. This issue has been stated in Holy Quran with many examples and suggestions. Precise reflection in these verses can have a notable influence on changing the views and beliefs of the society members, and these verses are proof of the policies, actions, and plans that humanity has reached after years of experience against hazards.

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Authors' Contributions

Nouri M designed research; Nouri M and, Ostadtaghizadeh A and, Aghababaeian H and, Roohani-Majd A, conducted research; Nouri M and, Ostadtaghizadeh A and, Olyanasab Z and, Azami-Aghdash S and, Nateghpour M and, Khalesinejad J wrote the paper. Asghari Jighe M had primary responsibility for final content. All authors read and approved the final manuscript.

Ethical Considerations

Informed written consent was obtained from all participants, and also all methods were performed in accordance with the relevant guidelines and regulations.

Ethical Approval

Current study was approved by the Ethics Committee of Tehran University of Medical Sciences (TUMS) Ethics Code: IR.TUMS.VCR.REC.1397.858.

Conflict Interests

The authors declared no conflict of interests.

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