

# An Overview of Health-Related Challenges in a Mass Gathering

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## Abstract

**Background:** Arbaeen is one of the world's largest religious gatherings. It is held in Karbala, Iraq, and can pose many significant challenges to the health of pilgrims and the host population as well as the health system of Iraq.

**Objectives:** The present study was conducted to reflect an overview of the health-related challenges associated with the Arbaeen ceremonies.

**Methods:** This qualitative study was conducted from October 6 (ten days before Arbaeen ceremonies) to October 16, 2019, in Najaf, Karbala, and the route pilgrims walk in Iraq. Semi-structured and in-depth interviews were conducted with disaster and emergency specialists, health experts, nurses, general physicians, and specialist doctors. Twelve experts and six pilgrims were interviewed. Thematic analysis was used to analyze the data.

**Results:** The findings were categorized into three main groups: treatment issues, public health, and infrastructure. The main complaints pilgrims had were bone and joint pain, muscle spasms, headache, toothache, pharyngitis, rhinorrhea, and common cold, purulent throat, and gastrointestinal symptoms. The main problems of those with chronic conditions included having forgotten to take medications or running out of medications. Food and water safety and sanitary conditions were inappropriate. Iraq's health system was not prepared to fulfill the health needs of the people at such a gathering.

**Conclusion:** Arbaeen ceremonies impose a heavy burden on Iraq's healthcare system and cause numerous health challenges. Moreover, Iraq's healthcare system does not have the capacity or readiness to meet the challenges of this event; international aid from the countries whose citizens attend the event are needed. Although the Iranian Red Crescent cooperated extensively, the collaboration must be more coordinated and broadened.

**Keywords:** Health, Mass gathering, Arbaeen, Iraq, Planning.

## Introduction

Any structured or spontaneous event leading to a large number of people gathering in a particular site for a specific aim in a determined period, putting pressure on the response resources and social programs is called a mass gathering (1). Mass gatherings are divided into different categories, including religious ones. Arbaeen is one of the world's largest religious gatherings. It is held in Karbala, Iraq on the 40<sup>th</sup> day after the martyrdom anniversary of Imam Hussein, the third Shia Imam. In this ceremony, which begins about ten to fourteen days before Arbaeen on the 20<sup>th</sup> of Safar and continues until the end of Arbaeen Day. During this period, many pilgrims walk the distance between Najaf and Karbala (2-4). More and more people attend the event each year, such that the number of pilgrims has increased from 3 million in

2003 to about 21 million in 2019. This population could pose many significant challenges to the pilgrims' and host population's health as well as on the healthcare system of Iraq (5,6).

Some of these challenges include the epidemic of infectious diseases, human stampede, lack of proper transport systems, inappropriate habitation, lack of specialist physicians, and improper health systems among others. The inadequate health infrastructure in Iraq and lack of preparedness and planning make these problems worse (3,7-9). A proper response to these challenges requires planning and preparation before the ceremony. Moreover, planning requires the provision of information on the conditions of gatherings and the health system's strengths and weaknesses in accountability.

## Objectives

Therefore, the present study was conducted as a field study based on interviews, researcher's observations, and checklists to reflect an overview of health-related challenges faced during Arbaeen, 2019. The results could be used to enhance the health system's preparedness to meet the challenges of the event in the coming years.

## Materials and Methods

This qualitative study was conducted from October 6 (ten days before the Arbaeen ceremonies) to October 16, 2019 in Najaf, Karbala, and on the route walked by pilgrims in Iraq.

### Participants

Semi-structured and in-depth interviews were conducted with disaster and emergency specialists and health experts, nurses, general physicians, and specialist doctors. Pilgrims were also interviewed. The inclusion criteria for healthcare specialists included having a minimum education of bachelor's degree, having executive experiences and related investigations as well as a willingness to participate in the investigation. Specialists were allowed to withdraw from the study whenever they chose. The inclusion criteria for pilgrims were fluency in the Persian language, participation at least twice in the Arbaeen ceremonies, and a willingness to participate in the interview. Available and purposeful sampling methods were used. Individuals meeting the inclusion criteria were enrolled in the study. The goals and significance of the study were explained to the participants, their consent was taken, and the researcher met with and interviewed them at appropriate times.

### Data gathering

Data on different realms of healthcare (treatment, public health, and infrastructures) was gathered using specialized checklists extracted from emergency operations plan (EOP), field visits, and in-depth and semi-structured interviews with participating specialists and pilgrims. The expert team consisted of disaster healthcare specialists who had experience working in clinical, health, and executive areas. Interviews were conducted in healthcare centers as well as pilgrims' accommodation spots. Moreover, to conduct field visits and observe, one researcher took part in all the ceremonies, like the other pilgrims, and stayed in pilgrim accommodations.

In-depth and semi-structured interviews, each lasting approximately 30-40 minutes, were conducted with the participating specialists. The experts and specialists were asked to speak about the challenges of providing healthcare services during Arbaeen. The following question was asked: "1. In your opinion, what are the challenges of providing healthcare services in Arbaeen?" Follow-up

questions like "why?", "how?", and "Would you explain more about...?" were also asked during the interviews. Twelve experts and six pilgrims were interviewed individually in Karbala or Najaf. Interviewing stopped when the data saturation point was reached. A total of 18 interviews were conducted. The same researcher did all the interviews; the interviews were recorded with a voice recorder and transcribed immediately afterwards. The researcher also took notes during the interviews.

### Data analysis

Data analysis was done at the same time the data was gathered using thematic analysis in the following five phases: A) familiarizing oneself with the data; B) creating preliminary codes; C) searching for themes; D) inspecting categories and subcategories; and E) preparing reports. After analyzing the content of the interviews, the researcher omitted any redundant codes, analyzed the data again, and classified the data into 3 main categories.

### Rigor

To guarantee the accuracy and precision of the qualitative data, the criteria suggested by Guba and Lincoln, that include trustworthiness, transformability, dependability, and confirmability, were used.

### Ethical considerations

The researchers introduced themselves to the participants, explained the goals of the investigation, and assured them of the confidentiality of all data recorded during the interviews. Participants were also assured that they could withdraw from the study at any phase they did not want to continue their cooperation.

## Results

A total of 18 interviews were conducted. The findings were categorized into three main groups: treatment, public health, and infrastructures. These three groups, however, were interdependent, and there was a cause-and-effect relationship between them.

### Treatment

The patients' major complaints were divided into acute and chronic categories. Acute complaints included bone and joint pain and muscle spasms caused by walking, headache, toothache, pharyngitis, rhinorrhea, symptoms of a cold, purulent throat, allergic rhinitis, skin inflammation (especially blistering of the foot and heat rash [miliaria] in the groin area), gastrointestinal problems (diarrhea, vomiting, stomachache, and sometimes constipation), eye redness and irritation, insect bites, and itchy skin. There were also cases of trauma to the organs and skin lesions. The most important problems related to chronic disorders were having

forgotten to take medications and running out of medications among the pilgrims, specifically those for diabetes, hypertension, and, in some cases, cholesterol medications. In addition, many pilgrims referred to medical centers to check their blood sugar and blood pressure levels. It should also be noted that some diabetic patients used insulin and had difficulty keeping their medication refrigerated. The most commonly used medications included analgesics, cold tablets, antitussives, anti-nausea medicine, anti-diarrhea medicines, antacids, ointments, antihistamines, antibiotics, eye drops, oral diabetes medicine (Metformin), and antihypertensive drugs.

### Public health

Public health-related challenges were categorized into the following groups:

1. Food health and safety: Food production and distribution processes were mostly inappropriate and unhealthy.

2. Water and drinks: Some water demands were met using bottled water, which were healthy but not adequate due to overcrowding, so part of the water demand was met using plastic water containers containing unhealthy prepared water and ice. Other beverages, such as syrups, tea, and milk, were also distributed. Tea and milk were boiled so they could be regarded as healthy, but the cooled beverages were not healthy and safe. Although some distributors used disposable glasses, the beverages were mainly distributed in glass cups commonly used by a lot of people.

3. Toilets and bathrooms: Some bathrooms and toilets were provided as conex buildings and were available along the walking route. Some were in the accommodations (mawakibs), but they were not enough to meet the demands of such a huge population. Moreover, the water supply system of the sanitary facilities was poor. The toilets were often dirty and lacking hand-washing liquid.

4. Sleep and rest locations: The pilgrims' sleep and rest places were either Iraqi homes or mawakibs (either in building or tent form). In both types of accommodations, many people from different cities and countries came together and used common mattresses, pillows, and blankets for sleeping. In addition, some mawakibs did not have cooling supplies, which caused additional problems for the pilgrims due to the hot weather.

5. Observance of personal and public health and perceiving health risk: Health culture was poor in the host population as well as in some pilgrims. Indeed, proper hand washing, use of toilets, and use of mugs and personal belongings were not observed. People had inadequate knowledge of healthcare practices, such as the provision of healthy water and food, avoidance of overeating, and use of masks. Walking barefoot was another unhealthy habit. Furthermore, high-risk groups, such as children and elderly individuals, people with

underlying chronic illnesses, and disabled people, participated largely in the ceremonies.

6. Waste collection and sewage disposal system: A few trash cans were placed along the walking route, were emptied by garbage trucks. However, the number of buckets and trucks was insufficient, and a lot of trash was scattered along the road. Some wells were drilled to dispose of sewage, but in total, the sewage disposal system was ineffective and clogged sewer lines were a common problem.

7. Weather conditions: The hot weather was problematic, causing people to heat up and sweat. In addition, the occurrence of severe wind and sudden dust followed by a heavy rainfall forced a large number of people with respiratory problems and trauma to refer to treatment centers.

### Infrastructure

Iraq's health infrastructure was poor. A lack of health issue supervision, shortage of health facilities, and inadequate and unqualified personnel and health processes were the main challenges. Some healthcare provider stations had no medical licenses, and even unskilled and unqualified health professionals provided and prescribed some medications for the pilgrims along the walking route. No comprehensive plan had been developed or even anticipated to address the health issues. It should be noted that the Iranian Red Crescent Society had dispatched a large number of ambulances to the holy cities of Najaf and Karbala and had set up medical centers, which were helpful but not sufficient.

### Positive points

Interviews and observations revealed that despite the numerous challenges, the pilgrims in the gathering experienced mental tranquility and calmness and had a special passion and enthusiasm. Many had attended the gathering several times to achieve mental relaxation.

### Discussion

This study provided an overview of health challenges at the Arbaeen 2019 ceremonies. With respect to the treatment challenges, the most common complaints were related to joint and muscle pain, common cold symptoms, gastrointestinal disorders, skin and trauma problems, and chronic challenges including blood sugar and blood pressure level checks, forgetting to take relevant medications, or impaired storage conditions for medicines needing refrigeration. Similar results were obtained by Lamie et al., who reported the most common problems encountered by pilgrims were fever, cough, cold symptoms, food poisoning, joint pain, acute skin complaints, hypertension, diabetes, and asthma (5). The present study found the most commonly used medications to include analgesics, common cold and

antitussive medications, anti-nausea and anti-diarrhea medicines, antacids, ointments, antihistamines, antibiotics, eye drops, oral diabetes medicine (Metformin), and antihypertensive drugs. Likewise, Lamie et al. reported that analgesics, antispasmodics, and anti-nausea, anti-diarrhea, anti-hypertension, and oral anti-diabetes medicines were among the most commonly used drugs (5). The current findings further indicated that the majority of acute complaints were due to walking during the ceremonies. Other complaints were mainly health issues and challenges. Other challenges related to chronic illnesses involved the presence of people with chronic illnesses and even critically ill patients having forgotten to take medicines, difficult and limited access to a pharmacy during the ceremonies, and difficulties in proper drug storage. These challenges reflected the need to inform patients and their families of the health risks related to attending the event and even preventing sick people from doing so. Training programs should focus on the following issues: taking medications and blood sugar and hypertension supplies, wearing masks, wearing proper walking shoes, proper nutrition, and providing safe food and water. Patients should consult with their physicians and be trained to replace medications requiring special storage conditions with other medicines before attending the ceremonies. Furthermore, the development of licensed care centers, employment of trained staff, provision of necessary equipment, and organization of service centers by nongovernmental organizations (NGOs) can help alleviate these problems.

The present study identified another set of challenges related to public health issues, including food, accommodation, bathrooms and toilets, personal and public health observation, perceived health hazards, waste collection and disposal systems, and weather conditions. These findings have been supported by many studies (9). Solving these challenges requires a great deal of effort on the part of Iraq's health system and that of other countries attending the event. More importantly, pilgrims should receive training in their country of origin to raise their awareness of the health risks. Since this is a religious gathering, clergymen and religious people can play an important role in training and changing people's attitudes and the perceived risks. Although interviews with people who had attended the event previously indicated a high level of hygiene and sanitation promotion compared to previous years, conditions were still not at an acceptable level. Health surveillance systems need to be developed, health facilities should be expanded, and training programs should be held for individuals involved in the provision and distribution of food and beverages. Moreover, sanitary facilities including bathrooms and toilets and pilgrims' accommodations should be developed by municipal authorities in the cities of Iraq.

The health system should also be monitored, and municipalities need to expand their waste collection and disposal facilities. Travel guidelines such as mandatory vaccination can be helpful as well.

Based on the current findings, the most important problem appeared to be the poor healthcare system in Iraq, which resulted in other health challenges. Since the ceremony starts approximately 14 days before the day of Arbaeen, not everyone attending the event is present on a specific day. Pilgrims return to their city or home countries after performing religious rituals, entering and leaving Iraq during the 14 days of the event, and the population burden on the host community decreases. However, since Iraq has been plagued by destructive wars and foreign and internal conflicts for years, its system has been poorly developed and has suffered several setbacks. Thus, it is unable to meet the system's needs. Therefore, the countries attending this ceremony need to support the system for further developments.

In order to develop the health system and respond appropriately to this mass gathering, the following key principles are suggested:

1. Establishment of risk assessment and management systems, monitoring systems, and warnings and announcements of contagious outbreaks and response strategies along with effective communication strategies;
2. Rapid and early detection and diagnosis of people with communicable diseases for quarantining and isolation, if necessary, and the application of infection control measures (5);
3. Development of care plans and medical guidelines (preventive medicine, compulsory vaccination, nutrition management, water and waste management, and hazard detection);
4. Development of public health promotion strategies (providing safe water and food and health supervision system for the provision and distribution of food and syndromic care);
5. Planning for rapid response to emergencies (quick access to critically ill and injured patients, on-site triage and support centers, providing on-site care for minor injuries and illnesses, and rapid and timely evacuation of at-risk people who need relocation) (10);
6. Development of mobile treatment and care units, health stations, and the design and construction of mobile hospitals;
7. Application of modern technology to provide supportive care, rapid diagnosis and collection, information analysis and sharing, and communication;
8. Development and updating of travel guidelines, including mandatory and optional vaccinations;
9. Development of waste collection and disposal facilities;

10. Establishment of a health monitoring system for recreational areas, sanitary facilities, and bathrooms;

11. Pilgrimage-based education on personal and public health and understanding the risk factors for acute and chronic diseases (3,11).

Based on the current results, pilgrims in the gathering experienced mental tranquility and calmness. Jalali Farahani et al. achieved the same results (6).

The current study had some limitations, including the inability to visit Iraq's health management centers, the inability to inspect the hospitals, no access to accurate patient statistics, and patients' main complaints. Yet, the researchers' presence on the walking route and accurate observation of the pilgrims' health status were among the strong points of the research.

## Conclusions

The Arbaeen ceremonies impose a heavy burden on Iraq's healthcare system and poses numerous health challenges. Iraq's healthcare system does not have the capacity nor the readiness to meet the challenges of this event, and international aid from the countries whose citizens attend the event is needed. Although the Iranian Red Crescent Society has cooperated a great deal, they must be more extensively coordinated. Overall, two important issues need to be considered in mass gatherings. One is the fact that these gatherings may become the target for terrorist or bioterrorist attacks. The second is that the presence of millions of pilgrims from different countries is more likely to increase the spread of emerging and re-emerging infectious diseases across the borders of participating countries (4). Therefore, the countries with more pilgrims attending the ceremonies need to take some measures. Establishing a joint committee known as the Arbaeen Disease Control Committee (ACDC) among the attending countries such as Iraq, Iran, Pakistan, Afghanistan, and some Gulf States can be very helpful. The committee will be able to monitor and identify health challenges, design and implement programs to respond to the challenges, and provide the strategies necessary for dealing with potential issues.

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## Authors' Contribution

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