Challenges and Promotion Strategies of Military Temporary Medical Centers in Arbaeen Pilgrimage: A Qualitative Study

Abstract

Aims: Undoubtedly, the Arbaeen pilgrimage is considered one of the largest annual religious gatherings in the world. A large number of pilgrims participate in this event, which can pose many challenges to their health. These challenges include respiratory, digestive, and infectious diseases; muscle and skeletal problems; various types of traumas; heatstroke or frostbite; and even the recurrence of chronic diseases. Additionally, it overshadows the local healthcare infrastructure, and the establishment of Military Temporary Medical Centers (MTMCs) seems necessary, as the health system is overcapacity. In this regard, the aim of this study is to examine MTMC challenges and identify solutions to overcome these challenges.

Methods: This qualitative approach involves various methods of data collection, including in-depth and Semi-structured interviews and field observations. The participants were selected via the purposive sampling method. This research was carried out by observing the approach of maximum diversity among the target population comprising managers, healthcare decision-makers, providers, and clients of the MTMC in the 2024 Arbaeen Pilgrimage.

Findings: Data saturation was achieved after conducting 15 interviews. By analyzing the data, codes were extracted and placed in two domains: challenges and promotion strategies. The main categories of challenges include resources and infrastructure, leadership and organization, community and knowledge, health and safety, and in the promotion strategies domain, the main categories include resource optimization, leadership and development, community and awareness, health and safety.

Conclusion: Overall, identifying and managing these challenges can provide evidence-based guidance for policymakers and planners involved in this major religious event.

Keywords: Challenges, Promotion strategies, Military Temporary medical centers, Arbaeen pilgrimage, Qualitative research.

Introduction

The Arbaeen pilgrimage is considered one of the largest peaceful human gatherings in the contemporary world [1]. Every year, approximately 17 to 20 million people from different countries participate in this great march [2]. These events pose significant public health challenges related to the well-being of participants and the provision of health care services [3].

If a mass gathering is not carefully managed, it can lead to the spread of infectious diseases, which threatens global health security and even the political security of countries [4]. In the pilgrimage of Arbaeen, like any other human gathering, owing to population density and nonobservance of the basic principles of hygiene, the spread of communicable diseases has increased [5]. Gastrointestinal diseases are also caused by cultural differences in the eating habits of countries [6]. Additionally, heatstroke is possible because of the heat of the air in Iraq during the summer season of pilgrimage [7]. Musculoskeletal disorders due to not following the basic principles of walking, skin diseases, and blisters on the feet due to using inappropriate shoes or walking nonstop without rest are observed in some people [5]. As a result, pilgrims often seek medical care on the pilgrimage route [1]. According to the Iranian Red Crescent Society, during the 2023 Arbaeen pilgrimage, pilgrims provided health care services to Military temporary medical centers (MTMCs) [8].

MTMCs are practical solutions for meeting health and treatment demands in mass gatherings, such as the Arbaeen pilgrimage [9]. MTMCs have key features, such as rapid deployment for urgent medical needs; increased patient care capacity; addressing a variety of medical needs, including first aid, chronic disease management, and physical and mental preventive care; and providing basic medical services, including triage, treatment, and coordination with local health care systems and emergency response teams [10, 11]. In addition, considering the long distances and numerous health challenges that pilgrims face, MTMCs play a vital role in ensuring the health and safety of pilgrims [12, 13].

Various quantitative and qualitative studies in countries such as China, the United States, and Spain have examined the challenges of medical centers and temporary hospitals in disasters, some of the

reported challenges included: lack of human resources and equipment, an inability to predict the number of patients and communication problems. Additionally, the difficulty of sending a large number of experienced specialists with related clinical records to these centers [14-17]. Another study which examined the challenges of MTMCs in Arbaeen, reported lack of experienced health workers [18]. Overcoming challenges and improving MTMCs requires a multifaceted approach. According to a study, strategies such as surge capacity management, staff training, and enhanced communication systems are crucial [19].

According to the mentioned cases and the special importance of holding the Arbaeen pilgrimage in Islamic countries, especially Iran, health issues and facilities should be taken into consideration. Although studies have been conducted in this field, our information about the challenges and Promotion strategies of MTMCs in our country's context is still limited. This study was conducted to address the existing research gap, increase our understanding of the challenges and promotion strategies of MTMCs during the Arbaeen pilgrimage, and provide new information for improving the health and safety of pilgrims.

Information and Methods

Study Design

The present research is a qualitative study with a conventional content analysis approach, utilizing Granheim and Lundman's method for data analysis, conducted in 2024 [20].

The study settings include the military temporary facilities providing health services along the route where the Arbaeen pilgrimage ritual was performed. These settings inside the country included clinics, health-treatment centers, and sites situated in the Ilam and Khuzestan Provinces in Iran.

Study participants

Since this was a qualitative study, the participants were selected via a purpose-based sampling method with maximum diversity. Because these people are more than any other person able to describe the different aspects of the challenges and promotion strategies of MTMCs, sampling with maximum diversity [21], was performed from MTMCs located in Ilam and Khuzestan Provinces in Iran. The participants included executive directors, policymakers, physicians, nurses, health and paraclinical staff in MTMCs, Iranian patients and other people referred to MTMCs during Arbaeen days (such as patients' companions), as well as people working in cooperating and supporting organizations of the health system in the 2024 Arbaeen event. The interviews continued until data saturation was reached so that no new issues were raised in subsequent interviews.

The participants in this research were 15 people, including 4 managers, 8 health workers, 1 patient's companion, and 2 patients of military temporary medical centers.

Data collection and analysis

Semi-structured interviews based on the interview guide were used to collect information. From the beginning, the purpose of the study was explained to the participants, and by obtaining written consent and observing ethical considerations (keeping information confidential and the right of participants to withdraw from the research at any time), the interviews were conducted and recorded with the consent of the participants. Ten interviews were conducted face-to-face, and five interviews were conducted over the phone, each lasting from 30-45 minutes. The interviews were conducted individually. The interviews continued until information saturation was achieved, and no new topic was raised in the subsequent interviews [22]. At the beginning of the interview, general questions such as "Tell me the experience of a day's work or attending a MTMC?" were asked, and "What are the health challenges in MTMCs in Arbaeen pilgrimage?" and "What strategies do you suggest to improve health services in MTMCs in Arbaeen pilgrimage for the coming years?" The participants were then asked probing questions such as "Can you talk more about this?" The interviews followed. Finally, the participants were asked to express any comments that remained. The location of the interview was determined according to the preferences of the participants. Field notes were another method of data collection that was considered in the data analysis. In this case, the researcher visited several centers and recorded his observations.

The interviews were first written via Microsoft Word software. The transcripts of the interviews were read several times by the researchers for overall understanding. To analysis the data, Granheim and Lundman's conventional content analysis method was used [20]. During the data collection process, the researchers performed coding analysis and continuous comparisons. Similar codes were placed in the sub categories and then placed in the categories according to the similarities and differences of the sub categories.

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Findings

The results of the study were that the initial codes obtained from the interviews were 1576 codes. After integration via conventional conceptual analysis, they were classified into two domains: challenges and promotion strategies as follows. The results of our study not only address all the previously identified challenges but also bring attention to several new issues such as environmental conditions (heat waves, dust, etc.), cultural differences and considerations such as personnel adaptation. The specific strategies and solutions expressed by the participants for all the existing challenges were categorized and presented.

In the challenges domain, there are 4 main categories and 10 sub categories including resources and infrastructure (equipment challenges, logistic challenges, environmental challenges), leadership and organization (command and management challenges, manpower challenges), community and knowledge (informational and educational challenges, pilgrims challenges), health and safety (disease control challenges, health challenges, safety and security challenges). A description of the findings is given (Table 2).

In the promotion strategies domain, there are 4 main categories and 10 sub categories including resource optimization (equipment enhancement, environmental adaptation, logistics improvement), leadership and development (effective management, manpower development), community and awareness (support pilgrims, information and education outreach), health and safety (safety and security measures, health promotion, disease prevention and control). A description of the findings is given (Table 3).

The study also showed that the mean age of the participants in the study was 43 years, and their mean work experience was 14 years. The individual characteristics of the participants are shown in Table 1.

Table 1: Individual characteristics of the participants

participants	Age	Education Level	Experience Work	Gender
N۰۱	۳۱	s'Master	years Less than ۱۰	Male
N۰۲	۳۸	s'Bachelor	years ۲۰ — ۱۰	Female
N۰۳	۴۳	General Practitioner	years ۲۰ — ۱۰	Male
N۰۴	۲۶	s'Bachelor	years Less than ۱۰	Male
N۰۵	۳۹	s'Bachelor	years ۲۰ — ۱۰	Male
N۰۶	۵۵	s'Master	*years More than ۲۰	Male
N۰۷	۲۸	s'Bachelor	years Less than ۱۰	Male
N۰۸	۳۳	s'Bachelor	years Less than ۱۰	Male
N۰۹	۴۸	s'Master	years ۲۰ — ۱۰	Female
N۱۰	۶۲	Phd	years More than ۲۰	Male
N۱۱	۳۵	s'Bachelor	*years ۲۰ — ۱۰	Male
N۱۲	۵۳	s'Bachelor	years ۲۰ More than	Male
N۱۳	۵۳	PhD	years More than ۲۰	Male
N۱۴	۳۹	General Practitioner	years ۲۰ — ۱۰	Male
N۱۴	۵۹	s'Bachelor	*years More than ۲۰	Male

.s companions' patient and patient of the participants were ۳ *

First, the challenges identified in the MTMCs in this study are described.

Resources and Infrastructure

Equipment challenges

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MTMCs in the Arbaeen pilgrimage face a shortage of medical, pharmaceutical, and communication equipment. Due to the tent structure of these centers and the heat of the air, a large amount of cooling equipment is needed. Notably, maintenance and repair of equipment in these difficult conditions is also a major challenge.

One of the participants stated, "*The temperature in the area where we were over 50 degrees and the air conditioners did not respond to the entire space of the center, it was very difficult to work in those tents.*" *[Participant 2]*

Logistics challenges

Transporting equipment and medicines to remote and scattered areas, traffic management and procurement, and storage and financial issues are important logistical challenges. Additionally, the distribution of facilities between centers is also very important.

Environmental challenges

Unfavorable weather conditions, dust, heat, and poor access to roads can have a negative effect on the performance of MTMCs. These conditions can reduce the efficiency of equipment and increase the risk of weather-related diseases.

One of the participants stated, "*The roads had terrible conditions, and we could only go back and forth with a series of special cars, and of course, in that weather, the cars sometimes did not even have air conditioners.*" *[Participant 11]*

Leadership and Organization

Command and Management challenges

Coordination between different treatment teams, the management of human resources and volunteers, the appropriate placement of centers, the creation of a registration and screening system for patients, and quick decision-making in emergency situations are among the challenges of command and management in these centers. A lack of strong management structures can lead to reduced efficiency and increased risks.

Manpower challenges

A lack of specialized and trained manpower, fatigue, and high work pressure are the most important challenges in this field. Additionally, attracting human resources under harsh environmental conditions is difficult and should be appreciated.

One of the participants stated, "*Before sending the personnel, people who are experienced in the required fields should be selected. Sometimes people come who do not have the experience and special expertise of the existing conditions and cannot provide special help.*" *[Participant 5]*

Community and Knowledge

Informational and educational challenges

Proper training of employees and pilgrims about disease prevention and management methods, the use of medical equipment, and compliance with health tips are among the informational and educational challenges. Additionally, there is a need for efficient information systems to manage data and information.

Pilgrims challenges

Pilgrims may constitute a vulnerable group with specific underlying diseases. Additionally, the need to provide medical services to pilgrims with different languages and cultures is also a major challenge.

One of the participants stated, "*You can imagine that almost all languages and cultures are different from the clients, and it was truly difficult to communicate properly with them.*" *[Participant 2]*

Health and Safety

Disease control challenges

A large gathering of pilgrims in one place can lead to the spread of infectious diseases. The management and control of these diseases require detailed planning and interdepartmental cooperation. Additionally, the provision of enough equipment and medicines to address the spread of diseases is also highly important.

One of the participants stated, "*There was not much supervision over the cooking and distribution of food, and sometimes you go to the food distribution centers and there is a lot of garbage with flies and mosquitoes.*" *[Participant 10]*

Health challenges

The large gathering of pilgrims in one place, the lack of sanitary facilities, safe drinking water, and poor environmental hygiene can lead to many physical and mental health problems.

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One of the participants stated, "*Because most of the processions served food in disposable containers, there was a lot of garbage around the pilgrims' accommodations and routes, and some pilgrims did not expect this situation at all and were very worried about their health*." *[Participant 8]*

Security and safety challenges

Ensuring the safety of pilgrims and employees against various threats, including terrorist attacks and natural disasters, is highly important. Additionally, the safety of equipment and buildings should also be considered.

Table 2: Categories and sub categories of challenges MTMCs

Category	Sub categories	Codes
Resources and Infrastructure	**Equipment challenges**	Shortage of medical equipment
		Shortage of cooling facilities/comfort equipment
		Inadequate structure material
		Shortage of communication equipment
	Logistic challenges	Challenges of transportation
		Challenges of procurement
		Challenges of storage
		Challenges of financial
		Challenges of distribution
	Environmental challenges	Inadequate condition of roads
		Challenges of extreme heat
		Challenges of dust
Leadership and Organization	**Command and management challenges**	Challenges of cooperation and coordination
		Challenges of location placement
		Challenges of manpower organization
		Challenges of volunteer organization
		Challenges of screening pilgrims
		Shortage of disease surveillance systems
		Challenges of mass population management
		Challenges of unit command
	Manpower challenges	Shortage of personnel, especially women
		challenges of insufficient gratitude
		Insufficient rest and personnel fatigue
Community and Knowledge	**Informational and educational challenges**	Weakness in specialized training of personnel
		Poor information and education for pilgrims
		Weakness in documentation
		Weakness of information sharing
		Challenges of the health information system
		Shortage of treatment and care protocols
	Pilgrims challenges	Challenges of cultural differences
		Challenges of vulnerable group
		Challenges of chronic patients
		Challenges of insurance for pilgrims
Health and Safety	**Disease control challenges**	Challenges of infectious diseases
		Challenges of vector-borne diseases
		Challenges of waterborne diseases
		Challenge of foodborne diseases
	Health challenges	Issue of personal health
		Concern of environmental health
		Deficiency in water and food hygiene
		Challenge of health accommodation
		Issue of public health
		Challenge of psychological health

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	Safety and security challenges	Challenges of security and safety for pilgrims
		Challenges of security and safety for personnel
		Challenges of security and safety for MTMC
		Challenges of security and safety for equipment

Our study specifically addresses equipment challenges, logistical issues, environmental conditions, and cultural differences among pilgrims during the Arbaeen pilgrimage. These challenges were not fully explored in previous studies.

The following are the promotion strategies extracted from the study.

Resource optimization

Equipment enhancement

Upgrading and improving equipment and modifying the design and structure of MTMCs play an important role in improving the quality of medical services provided to pilgrims. By using advanced and up-to-date medical, welfare, and communication equipment, patients can be treated more effectively and problems can be prevented.

Environmental adaptation

Adapting MTMCs to the environmental conditions of the Arbaeen pilgrimage, including temperature, humidity, and weather conditions, is of great importance. By adjusting equipment and facilities to these conditions, we can ensure the optimal performance of treatment centers and provide better services to pilgrims.

One of the participants stated: *" Almost all roads and trails are dirt, so due to the high dust, tents should be equipped with air purifiers." [Participant 11]*

Logistics improvement

Improvement of logistics services in MTMCs, including timely transfer and distribution of needed items and proper storage, plays a significant role in increasing the efficiency and effectiveness of these centers. With proper resource management and careful planning, we can avoid shortages and logistical issues.

One of the participants stated: *"Many times, with planning and distribution management, we can prevent wasted costs and shortages." [Participant 3]*

Leadership and Development

Effective management

Improving command and management through the establishment of efficient management structures and necessary training for staff can enhance the coordination and efficiency of these centers. With proper management and timely decision-making, we can prevent problems and miss coordination.

Manpower development

Allocating the manpower to the right number and paying attention to the work and rest schedule helps a lot to improve the services provided.

One of the participants stated: *"A sufficient number of personnel, especially women, can help a lot." [Participant 9]*

Community and Awareness

Information and education outreach

Enhancing the skills of staff through specialized training can significantly improve the quality of healthcare services in MTMCs during the Arbaeen pilgrimage. By boosting staff capabilities, we can deliver more effective and higher-quality services.

One of the participants stated: *"Personnel should be trained according to the existing conditions before being sent, and great care should be taken in selecting efficient personnel." [Participant 3]*

Support pilgrims

In MTMCs during the Arbaeen pilgrimage, it is crucial to adapt healthcare services to accommodate the diverse cultural backgrounds of pilgrims. This includes understanding and respecting different cultural practices and beliefs to provide effective care. Additionally, managing chronic diseases such as diabetes and hypertension is essential, as these conditions can be exacerbated by the physical demands of the pilgrimage.

Health and Safety

Disease prevention and control

Paying attention to the quality of water and food and the vectors in the region, along with providing care and prevention methods such as vaccination, helps a lot to control epidemics.

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Providing health consultations and distributing hygiene materials such as masks and sanitizers can help reduce the burden of illnesses and health issues during the Arbaeen pilgrimage.
One of the participants stated: *"For the paths, a bunch of people are needed to collect the garbage and give the necessary training to the pilgrims." [Participant 8]*

Safety and security measures

Improving security and safety in MTMCs through the establishment of appropriate infrastructure and implementation of safety protocols can help reduce risks and adverse incidents. By creating a safe and secure environment, we can protect the health and well-being of pilgrims.
One of the participants stated: *"Safety and security should be given a lot of attention by the officials and specialized teams should be sent for this work"[Participant 10]*

Table 3: Categories and sub categories of promotion strategies MTMCs

Category	Sub categories	Codes
Resource optimization	**Equipment enhancement**	Providing the necessary medical equipment
		Installing air conditioning systems and equipping comfort facilities
		Choosing the right structure for the conditions of the region
		Provision and installation of advanced communication equipment
	Environmental adaptation	Improvement and repair of roads
		Create shaded areas and distribute cool water
		Use breathing masks and air purification systems.
	logistics improvement	Improving the transportation system and using appropriate vehicles
		Strengthening the effective management of resources
		Creating suitable warehouses and proper management of warehouses
		Providing the required financial resources
		Improving the distribution system and using new technologies
Leadership and Development	**Effective management**	Coordination between departments and holding regular meetings
		Choosing suitable places with easy access
		Effective organization of human resources
		Recruiting required volunteers and using them correctly
		Equipping and using office automation
		Creating effective and fast screening systems.
		Establish disease monitoring and reporting systems
		Crowd management using technology and proper planning
		Establish a single command structure
	Manpower development	Sending more staff, especially women
		Establish systems of appreciation and honoring employees
		Improving the time and place of employees' rest
Community and Awareness	**Support vulnerable group**	Respecting cultural differences and training employees in this regard
		Provision of services to vulnerable groups
		Creating special care programs for chronic patients
		Creating suitable insurance systems for all pilgrims
	Information and education outreach	Holding specialized training courses for employees
		Providing necessary information and training to pilgrims
		Creating effective and accurate documentation systems
		Improving information sharing systems
		Creating and strengthening health information systems
		Creating and implementing treatment and care protocols
Health and Safety	**Safety and security measures**	Ensuring the security and safety of pilgrims using security forces
		Ensuring the safety and security of employees
		Establish security and safety systems for MTMC
		Protection against theft and destruction of equipment
	Health promotion	Distribution of personal hygiene items and training

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		Cleaning the environment and proper waste disposal
		Ensuring safe water supply and food quality monitoring
		Creating suitable health and accommodation facilities
		Providing public health education
		Providing counseling and psychological support services
	Disease prevention and control	Prevention and control of infectious diseases through vaccination and education
		Control of vectors and prevention of vector-borne diseases
		Ensuring safe water supply and water quality monitoring
		Monitoring food quality and providing food hygiene education

The promotion strategies presented in this study include resource optimization, effective management, and tailored health and safety measures. These strategies provide actionable recommendations for policymakers and planners to enhance the efficiency and effectiveness of MTMCs during mass gatherings.

Discussion

The results of this study highlight the existence of ten subcategories to express the challenges in MTMCs, and in the following, the identified strategies to overcome the existing challenges and improve these centers during the Arbaeen pilgrimage ceremony are described. Several studies inside and outside the country have investigated the issue of health and the challenges of providing health services in mass gatherings. The results of some studies indicate a high prevalence of infectious diseases, such as Hajj and Arbaeen pilgrimage, in mass gatherings [23-25]. Infectious diseases are the most common health threat associated with mass gatherings [2, 4]. Viral respiratory infections are a major public health concern that cause serious illness, especially in vulnerable populations [26].

The needs and challenges of providing health services in MTMCs during the Arbaeen pilgrimage ceremony differ every year and depend on the season in which the ceremony is held [4]. Those planning mass gatherings should also consider the seasonality of some common conditions, such as flu-like symptoms that may be more likely to be expected in relatively colder months and cases of diarrhea and food poisoning that may be more common in colder months. Warmers are more likely [25]. According to a study published by Farah Al-Ansari and colleagues from Australia in 2021, one out of every five participants in the Arbaeen ceremony had a cough, and one out of eight had diarrhea. These results highlight the need to plan and implement preventive measures by governments, religious authorities, and participants in Arbaeen to prevent the spread of more serious infections. These measures can include health measures, health education, health equipment, and proper management of water and sewage resources [27].

Access to health centers can affect the occurrence of infectious diseases in large communities [11]. Ahmad Soltani et al.'s study on the challenges of health services during the Arbaeen ceremony revealed that the Iraqi health system faced many challenges during the Arbaeen pilgrimage. These challenges are multiplied by the infrastructural deficiencies in the Iraqi health system, the lack of detailed planning, and the ignorance of the participants. To address these challenges and minimize problems, the authorities of the Iraqi health system should cooperate with the organizations of other countries participating in the Arbaeen pilgrimage, provide participation and synergy, and provide health and treatment equipment and facilities. Additionally, multiorganizational comprehensive planning and internal and external coordination before the Arbaeen pilgrimage and the education of pilgrims are two key factors that can help hold ceremonies better [12].

Additionally, studies have shown that during the days of Arbaeen, the control of contagious diseases due to the low readiness of health systems, lack of equipment, inappropriate weather conditions [4], high population density [2, 4, 11], health infrastructure no resilience, limited control of infectious diseases and low understanding of participants about health risk factors are very challenging[2], which is consistent with the challenges raised in the present study.

In another study, Jalil Arab-Kheradmand et al. entitled the Health Services Survey in Arbaeen Ceremony 2019, 9 main categories, including trauma system, disease care system, health issues, education and health promotion, coordination and command of health cooperation in the health system, information management and communication, response planning, support and resource management, and safety and security, were identified as required factors [28], which is consistent with the findings of this study.

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Even with advanced equipment and adequate resources for disease prevention and control, the public health system can be under severe pressure. Facilities can affect the occurrence of infectious diseases in mass gatherings. Therefore, planners should pay attention to these factors in preparation. In preparation for the prevention of infectious diseases and their consequences, comprehensive planning, rapid diagnosis, and effective management are needed [4], and it is necessary to have equipment, facilities, and specialist personnel provided at the place of providing health services, according to needs assessments and studies [11].

In the review study by Moulai et al., titled "Challenges and Facilitators of the Arbaeen Ceremony", which was published in 2024, the most frequent challenges include the spread of infectious diseases; the poor management of the health system in Iraq in collecting and disposing of waste; the increase in the incidence of walking injuries among the pilgrims (such as burns, fractures, lacerations, wounds, and blisters); and insufficient knowledge about personal and public health. The most important facilitators to solve these challenges are specialized training of pilgrims and addressing their issues with a focus on vital procedures, extensive coordination of stakeholders (Health Ministries and Organizations), and the implementation of an agile syndromic system for rapid monitoring and identification of infectious diseases. These factors have also been identified in the findings of this study [13]. Additionally, a study conducted by Mohammadi Nia et al. in 2019 as a review of the condition of outpatients during the Arbaeen pilgrimage 2019 as a cross-sectional study in temporary clinics and health stations where pilgrims need nursing, midwifery, and service medicine was carried out by general and specialist doctors on the way from Najaf to Karbala, Iraq, during a period. The most common chief complaint. As reported by patients, 21% of musculoskeletal problems, 20% of foot blisters, and 20% of skin lesions indicate the need to provide more organized services, especially in emergency health care, and the need to pay increasing amounts of careful attention to the importance of the health history of the pilgrims who showed up in this ceremony [29]. Also, various studies focused on the need to pay attention to psychological preparation and providing psychological solutions [30, 31].

Conclusion

The results of our study highlight the undeniable need for Military Temporary Medical Centers (MTMCs) during the Arbaeen pilgrimage, which significantly impacts the health system's capacity. However, this necessity brings substantial challenges in delivering healthcare services. Our study not only addresses all previously identified challenges but also brings attention to several new issues such as environmental conditions (heat waves, dust, etc.), cultural differences, and personnel adaptation considerations. Solutions such as proper planning, resource allocation, addressing infrastructural gaps, improving coordination, and fostering a voluntary spirit can enhance the resilience and adaptability of these centers. Ultimately, the strategies and solutions expressed by the participants aim to improve the health of millions of pilgrims by categorizing and presenting specific approaches to tackle all existing challenges.

Study limitations

Limitations of this research include the lack of cooperation from some managers and employees, as well as the unavailability of individuals. These challenges often create difficulties in collecting comprehensive data. However, by clearly explaining the research objectives and emphasizing the necessity and coordination of the research team, many of these issues were reduced.

Acknowledgments

We are grateful to all those who helped us during this study.

Ethical Permission

This study is in accordance with the Declaration of Helsinki Rules and as a research project approved by the Ethics Committee of Aja University of Medical Sciences (Code: IR.AJAUMS.REC.1402.044). The participants provided written and verbal informed consent before the interviews and provided explanations of the study's objectives and methods.

They were assured that the recorded interviews would be deleted after the study concluded and that their personal information would remain confidential. Additionally, they were informed that they could leave the study at any time.

Authors' contributions

Sh.Z. handled data collection, analysis, and initial manuscript drafting. S.Sh., M.A. and F.T. designed the study and were involved in the conception of the study design and final revised the manuscript.

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