

## Reported Satisfaction with Health and Medical Services among Mashhad Pilgrims at the End of the Safar Lunar Month

Maryam Saberi-Karimian<sup>1\*</sup>, Somayeh Ghiasi Hafezi<sup>2\*</sup>, Malihe Aghasizadeh<sup>3</sup>, Shapour Badiee Aval<sup>4</sup>, Ali Ebrahimi<sup>5</sup>, Masoumeh Akbari<sup>3</sup>, Najmeh Seifi<sup>3</sup>, Seyed Javad Hoseini<sup>6</sup>, Yasamin Rajabloo<sup>3</sup>, Saeedeh Hoseinpour<sup>3</sup>, Mahboubeh Akbari<sup>3</sup>, Tayebeh Mohammadi-Esfidan<sup>3</sup>, Naser Vahdati-Mashhadian<sup>7</sup>, Mona Nematizadeh<sup>8</sup>, Mohammad Sadegh Abedi<sup>3</sup>, Marzieh Hasani<sup>3</sup>, Mahya Nekoumanesh<sup>8</sup>, Mobina Nekouyar<sup>8</sup>, Elahe Hasanpour<sup>8</sup>, Elmira Adim<sup>8</sup>, Habibollah Esmaily<sup>2</sup>, Monavar AfzalAghaee<sup>2</sup>, Gordon A. Ferns<sup>9</sup>, Mohammad Ali Kiani<sup>10\*\*</sup>, Majid Ghayour-Mobarhan<sup>3\*\*</sup>, Nayyereh Houshyar<sup>11</sup>

<sup>1</sup> Metabolic Syndrome Research Center, Mashhad University of Medical Sciences, Mashhad, Iran.

<sup>2</sup> Department of Biostatistics, School of Public Health, Mashhad University of Medical Sciences, Mashhad, Iran.

<sup>3</sup> International UNESCO Center for Health-Related Basic Sciences and Human Nutrition, Mashhad University of Medical Sciences, Mashhad, Iran.

<sup>4</sup> Department of Complementary and Chinese Medicine, School of Persian and Complementary Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

<sup>5</sup> Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

<sup>6</sup> Deputy of Health, Mashhad University of Medical Sciences, Mashhad, Iran.

<sup>7</sup> Departments of Pharmacodynamics and Toxicology, School of Pharmacy, Mashhad University of Medical Sciences, Mashhad, Iran.

<sup>8</sup> Department of Nutrition Sciences, Varastegan Institute for Medical Sciences, Mashhad, Iran.

<sup>9</sup> Brighton & Sussex Medical School, Division of Medical Education, Falmer, Brighton, Sussex BN1 9PH, UK.

<sup>10</sup> Department of Pediatrics, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

<sup>11</sup> The Education Development Center, Mashhad University of Medical Sciences, Mashhad, Iran.

### ARTICLE INFO

Article type:  
Original Article

Article history:  
Received: 2 November 2025  
Accepted: 19 May 2026

Keywords:  
Health Services  
Pharmaceutical Services  
Pilgrims  
Satisfaction

### ABSTRACT

**Introduction:** We aimed to evaluate the pilgrims' satisfaction with the health, medical, and pharmaceutical services in Mashhad at the end of Safar.

**Methods:** This was a cross-sectional study conducted in the Safar Lunar Month. Pilgrims were recruited using a convenience sampling method of individuals entering Mashhad city.

**Results:** A total of 6497 pilgrims participated in the study. Out of those, 409 pilgrims (6.3%) required some medical services. Approximately 175 people (42.7%) rated the quality of access to medical services as average or below average. In terms of emergency services, 93 pilgrims (1.4%) required assistance, with 54.9% (n=42) reporting below average satisfaction with treatment by emergency personnel. Additionally, 1134 individuals (17.7%) expressed that the hygiene of their accommodations was average or below average.

**Conclusions:** Regarding the low satisfaction of pilgrims with the health and medical services during the peak of travel, it is necessary to improve the healthcare system services to empower pilgrims to access better healthcare.

► Saberi-Karimian, M., Ghiasi Hafezi, S., Aghasizadeh, M., Badiee Aval, S., Ebrahimi, A., Akbari, M., Seifi, N., Hoseini, S.J., Rajabloo, Y., Hoseinpour, S., Akbari, M., Mohammadi-Esfidan, T., Vahdati-Mashhadian, N., Nematizadeh, M., Abedi, M.S., Hasani, M., Nekoumanesh, M., Nekouyar, M., Hasanpour, E., Adim, E., Esmaily, H., AfzalAghaee, M., Ferns, G.A., Kiani, M.A., Ghayour-Mobarhan, M., Houshyar, N. Reported Satisfaction with Health and Medical Services among Mashhad Pilgrims at the End of Safar Lunar Month. *J Cardiothorac Med.* 2026; 14(2): 1698-1708. Doi : 10.22038/jctm.2026.92422.1518

\* Equally as first Authors

\*\* Corresponding authors: **Mohammad Ali Kiani**, Department of Pediatrics, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran, 99199-91766, Tel: +985138413007, Fax: +985138413006, Email: kianima@mums.ac.ir

**Majid Ghayour-Mobarhan**, International UNESCO center for Health-Related Basic Sciences and Human Nutrition, Mashhad University of Medical Sciences, Mashhad, Iran, 99199-91766, Tel: +985138002288, Fax: +985138002287, Email: ghayourm@mums.ac.ir

© 2016 mums.ac.ir All rights reserved.

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/3.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

## Introduction

"Health for All by 2000" was published by the World Health Organization (WHO) in 1978 and was based on primary healthcare to be introduced globally (1). Patient satisfaction, on the other hand, has been considered an important part of high-quality healthcare and is receiving attention from healthcare professionals and policymakers (2). Renzi et al. reported that satisfied patients were twice as likely to have an improved quality of life in 2005 (3). Recent data showed that patient satisfaction is positively linked to higher treatment compliance, clinical effectiveness, lower mortality, shorter hospital stays, and more use of screening services (4, 5). Due to several positive outcomes, patient satisfaction is widely accepted as an important quality indicator in developed countries (6, 7). These indicators could be used to improve healthcare and lead to higher compliance from patients (8). It is also a crucial tool to monitor quality improvement in healthcare systems (9). Patient satisfaction investigations are used as a baseline when looking for strategies to improve the quality of healthcare (10). However, in developing countries, patient satisfaction metrics are rarely assessed (11).

Many factors can influence patient satisfaction, including patient characteristics. Characteristics such as age, gender, occupation, and marital status are associated with changes in patient satisfaction, although they are contradictory across different studies (12).

In comparatively religious populations, belief in God is common even among people who do not attend services (13). Likewise, there is a strong association between people's religiosity and their participation in religious activities (14). Although patient satisfaction is recognized as an indicator of health service quality globally, previous studies have been conducted in stable hospital settings and resident populations, with fewer addressing transient, mass, and ritual populations such as religious pilgrims (12, 15). The end of Safar (20-30th) includes several religious events, including the Martyrdom of Imam Reza and the death of Prophet Muhammad, attracting a large number of pilgrims from all over Iran and

other countries to the city. This event is considered one of the largest religious gatherings in the region, leading to a significant increase in demand for health services, the provision of temporary services, and changes in the pattern of referrals. These conditions can impact the perception of quality and satisfaction with services, making it challenging to generalize the results of studies in normal populations to this context. To date, no study has specifically examined reported satisfaction with health services among pilgrims in Mashhad during this peak period of gathering. According to the Deputy President of Health at the university, roadside healthcare services were provided for pilgrims on the routes of Qochan, Kalat, Torbat Jam, Freeman, Neishabor, Torbat Heydarieh, and Sabzevar in September 2022. There were a total of 160 active ambulatory stations (including 77 stations in the city and 83 stations in the suburbs covered by the university) and 262 active emergency stations (including 127 on the roads and 135 in urban areas) in Razavi Khorasan Province at the end of Safar. Furthermore, there were 135 health stations staffed by 680 health professionals and 810 other professionals each day.

Therefore, this study focused on a specific situation of a "mass religious gathering" in a developing country. It aims to fill the gap in the literature and provide practical evidence for planning and improving the quality of health services in similar conditions.

## Methods

### *Study Design and Subjects*

This was designed as a cross-sectional study conducted during the Safar religious events for 8 days from September 20th to 27th, 2022. The study was approved by the Research Committee of the university (ID: 4011079). The inclusion criteria were pilgrims who traveled to the city to visit the holy shrine at the end of the Safar lunar month.

Overall, there were 14 centers where interviews of pilgrims were undertaken, including train stations, terminals, healthcare stations, airports, mosques, and schools in the city. The pilgrims were recruited by convenience sampling and filled out the questionnaire specifically designed for this

study (Supplement 1).

### **Data Collection and Questionnaires**

Experienced interviewers collected demographic (e.g., age, height, weight, occupation, companions, place of stay, and goal of trip), medical history, and COVID-19 history data using the questionnaire. Body mass index (BMI) was calculated for each subject by dividing body weight (kg) by the square of height (m).

The online PORSLINE questionnaires in Farsi, English, and Arabic were handed out at the city entrances. The data were collected by 20 trained professionals. A 14-question questionnaire was designed using a literature review and input from health professionals. The questionnaire was designed in 3 main parts, after demographic characteristics, including the pilgrims' satisfaction with health, medical, and pharmaceutical services. All questions were rated on a Likert scale of five points, ranging from very poorly (lowest satisfaction) to very good (highest satisfaction scores). All data were checked for completeness, entered into a personal computer, and analyzed using SPSS (version 20).

Qualitative validity, as the content validity, was evaluated by using Cronbach's alpha. Then they were delivered to the health experts, and their opinions were obtained, and the comments were addressed. In this study, the results of Cronbach's alpha coefficient of 0.7 or higher were considered acceptable in SPSS to measure the reliability and internal consistency of the questions (16). Cronbach's alpha is the most effective internal reliability that was assessed in this study (17).

Furthermore, to provide more detailed evidence, we also used an open-ended question including "What was the main health/medical issue that you have faced during the trip? If yes, what do you suggest to solve it?".

## **Results**

### **Demographic Characteristics**

Table 1 shows the demographic characteristics of the population. A total of 6497 pilgrims, including 2729 women (42.9%), participated in the study. The

average age of pilgrims was  $37.79 \pm 15.36$  years. The results showed that around 98.9% and 1.1% pilgrims traveled to the city from the country and abroad at the end of the Safar, respectively (Table 1, Figure 1). Most of the pilgrims came from Tehran province (22.3%), followed by the surrounding cities (19.8%), and then Isfahan province (9.4%) (Figure 1).

1275 pilgrims (25.3%) had a history of non-communicable diseases (NCD), such that diabetes, high blood pressure, and cardiovascular disease were the most frequent. Approximately 1068 people (16%) required medicine, of which the most common drug use was allocated to increased blood pressure medicine by 447 people (42%) and lipid-lowering drugs by 205 people (19%) (Table 1). 4207 pilgrims (64.7%) had a history of being infected with COVID-19, so 172 people (7.5%) had a history of hospitalization. Moreover, 5808 people (89.5%) have received at least one dose of the vaccine 5389 people (83.1%) have received two doses of the vaccine (Table 1).

### **The Satisfaction with Medical Services**

Of the total sample, 409 pilgrims (6.3%) needed medical services during their trip. Of these, 175 people (42.7%) rated the access quality to medical services as average or less than average, and 192 people (46.9%) rated the access quality to pharmaceutical services as average or less than average (Table 2).

At the end of the Safar lunar month, 93 pilgrims (1.4%) received the emergency 115 services during their journey, of which 54 (58%) stated that the emergency staff arrived at the patient's bedside at the right time. More than 50% of the pilgrims ( $n=42$ ; 54.9%) reported their satisfaction with how emergency personnel dealt with the patient, and their companions were less than average (Table 2).

### **The Satisfaction with Health Services**

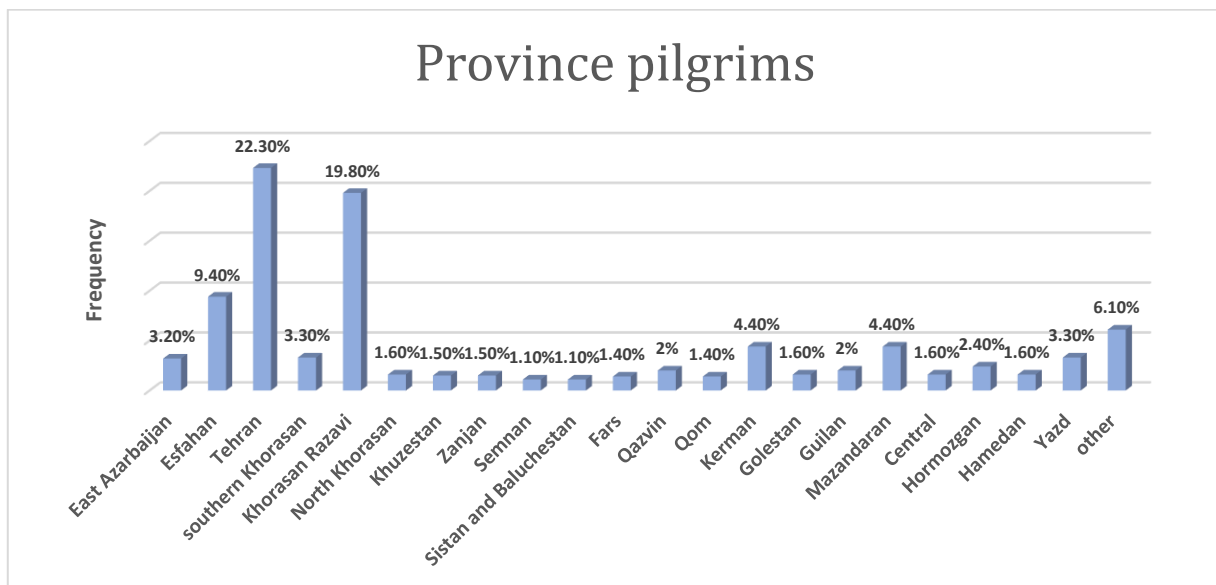
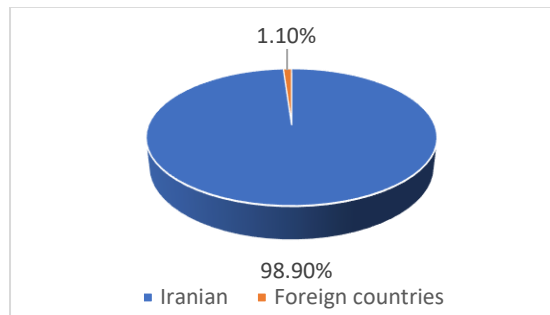
Around 3554 pilgrims (54.7%) declared that their satisfaction with the health status of foods in the religious tents (Mookebs) was more than average. 1134 people (17.7%) of the pilgrims declared their satisfaction with the accommodation's Hygiene was average and below average in the city (Table 3).

**Table 1.** Demographic clinical characteristics of the pilgrims (n=6497).

<b>Age (years)</b>	37.79±15.36	
<b>Nationality</b>	Iranian	6446(98.9)
	Foreign	72(1.1)
<b>Sex, n(%)</b>	Female	2729(42.9)
	Male	3724(57.1)
<b>BMI (kg/m2)</b>	BMI<18	372(7.5)
	18<BMI<25	2204(44.3)
	25<BMI<30	1608(32.3)
	BMI>30	790(15.9)
<b>Occupation</b>	Employee	1078(16.6)
	Freelancer (self-employed)	2319(35.7)
	unemployed	2147(33)
	Retired	434(6.7)
	Labor	342(5.3)
	Others	180(2.8)
<b>Accommodation in Mashhad</b>	Hotel	1986(30.6)
	Holy Shrine	2688(41.4)
	Relatives House	698(10.7)
	Motel	830(12.8)
	Religious Tents (Mookeb)	295(4.5)
<b>COVID-19</b>		
<b>Have you ever been infected with COVID-19?</b>	Yes	4207(64.7)
	No	2290(35.2)
<b>Have you ever been hospitalized due to COVID-19?</b>	Yes	172(7.5)
	No	2118(92.5)
<b>The number of COVID-19 vaccinations</b>	0	682(10.5)
	1	419(6.4)
	2	2345(36.1)
	3	2579(39.7)
	>3	465(7.3)
<b>Medical background</b>		
<b>Disease history</b>	Cardiovascular	269(21.09)
	High Blood Pressure	271(21.25)
	Pulmonary disease	44(3.45)
	Diabetes	281(22.03)
	Kidney Disease	51(4)
	Seasonal Allergy	88(6.90)
	Drug Sensitivity	141.09)
	Cancer	22(1.72)
	Other	235(18.43)
<b>Take medicine(s) right now</b>	Yes	1068(16.4)
	No	5429(83.6)
<b>Taking medicines by yourself</b>	Yes	106(9.9)
	No	962(90.1)
<b>Need to take special care</b>	Yes	409(6.3)
	No	6088(93.7)
<b>Type of special care</b>	Excellent	39(9.5)
	Good	52(12.7)
	Avarage	52(12.7)
	Poor	77(18.8)
	Very Poor	46(11.2)

<b>Drug history</b>	Anti-Hypertensives Drugs	447(31.97)
	Lipid-lowering Drugs	205(14.66)
	Hormons	95(6.79)
	Neurological Drugs	83(5.93)
	Digestive Drugs	57(4.07)
	Immunosuppressant painkiller-anti-inflammatory Drugs	96(6.86)
	Respiratory drugs	38(2.71)
	Anti-obesity drugs	16(1.14)
	Supplements	21(1.5)
	Herbal Medicines	27(1.93)
	Glucose lowering drugs	49(3.5)
	Other drugs	264(18.88)
<b>Food</b>		
<b>Food during the trip</b>	Fast-food	123(1.9)
	Home-made dishes	784(12.1)
	None of the above	5698(87.7)
<b>Types of food that are consumed during the trip</b>	Prepared in the restaurant	295(32.5)
	Prepared in religious Tents (Mookeb)	415(45.7)
	Canned Food	33(3.6)
	Raw foodstuffs are prepared by yourself	219(24.1)
<b>Meal frequency in a day</b>	one time per day	5701(87.7)
	two times per day	172(2.6)
	three times per day	427(6.6)
	None of them	458(7)

Quantitative and qualitative variables have been presented as Mean±SD and Number (%), respectively.



**Figure 1.** The frequency of Mashhad Pilgrims in different cities at the end of the Safar lunar month.

**Table 2.** Satisfaction with medical services.

<b>Satisfaction with medical/ pharmaceutical services</b>		
<b>Did you need medical services during this trip?</b>	Yes	409(6.3)
	No	6088(93.7)
<b>The quality of medical services accessibility</b>	Excellent	39(9.5)
	Good	192(46.9)
	Average	52(12.7)
	Poor	77(18.8)
	Very poor	46(11.2)
<b>The quality of pharmaceutical services accessibility</b>	Excellent	37(9.2)
	Good	174(43.2)
	Average	56(13.9)
	Poor	93(23.1)
	Very poor	43(10.7)
<b>Satisfaction with emergency services</b>		
<b>Did you receive any emergency medical services in case of health-related issues?</b>	Yes	93(1.4)
	No	6409(98.5)
<b>If yes, how did you receive this service?</b>	Visit the emergency medical service station in person	46(49.4)
	Emergency ambulance service on the road	12(12.9)
	Calling 115 (Emergency Medical Service)	35(37.6)
<b>How would you rate your experience?</b>	Very poor	
	Poor	
	Average	
	Good	
	Excellent	
<b>Were the EMS staff quick to respond to your medical care request?</b>	Yes	54(58)
	No	39(42)
<b>Based on your complete experience with Emergency medical services, how satisfied are you with the way the emergency personnel deal with you and your companion(s)?</b>	Very poor	46(49.5)
	Poor	5(5.4)
	Average	4(4.3)
	Good	16(17.2)
	Excellent	22(23.7)
<b>In case of transfer to the medical center, was there an emergency medical technician (EMT) beside the patient?</b>	Yes	54(80.59)
	No	13(19.40)
<b>Are you satisfied with the initial treatment performed by the EMS personnel?</b>	Very poor	13(14)
	Poor	4(4.3)
	Average	19(20.4)
	Good	28(30.1)
	Excellent	28(30.1)

**Table 3.** Satisfaction with health services.

<b>Restaurants' Hygiene in Mashhad</b>	Excellent	883(28.16)
	Good	1118(35.66)
	Average	978(31.19)
	Poor	156(4.97)
	Very poor	0(0)
<b>Religious Tents' (Mookebs') Hygiene in Mashhad</b>	Excellent	1097(24.39)
	Good	1610(35.80)
	Average	847(18.83)
	Poor	137(3.04)
	Very poor	805(17.90)

In this study, Cronbach's alpha was obtained as 0.88 in three questions on satisfaction with medical services, 0.74 in four questions on health and food services, and 0.80 in two questions on how to deal with emergency personnel with the patient and their companions. Considering that Cronbach's alpha values calculated for each of the dimensions and constructs studied in this research were greater than 0.7, the reliability of the tool was evaluated as very good and confirmed.

### **The Main Health and Medical Issue During the Trip**

Table 4 summarizes the main health and medical problems that pilgrims faced during their trip to the city at the end of Safar. 1184 pilgrims responded to this question, and the most important issues were: 1- dirty public spaces and low access to trashcans nearby the holy shrine during the peak of travels; 2- low quality of Religious Tents' (Mookebs') hygiene based on their rating in the city; 3- insufficient access to restrooms and drinking water on the roads; and 4- public spaces around the holy shrine and around the city.

### **Discussion**

Previous studies have only focused on pilgrim access to health and welfare services

in different pilgrimage cities (18-22). The current cross-sectional study is the first study to also investigate the pilgrims' satisfaction with health and medical services. This study had a large sample size and was conducted among 6497 pilgrims at the end of Safar.

In this study, the results demonstrated that 6.3% of pilgrims needed medical services during the trip. Furthermore, 42.7% and 46.9% of pilgrims rated the access quality to medical and pharmaceutical services as below average. Pilgrims by 1.4 % received the emergency 115 services.

During their journey, of which 54.9% had less than average satisfaction with "how to deal with emergency personnel with the patient and their companions". 17.7% of the pilgrims mentioned their satisfaction with the accommodation's hygiene was average and below average.

Akbari et al. studied the satisfaction of tourists in Mashhad in 2013 in 16 research projects. The results indicated that satisfaction with their vacation, sanitary state, and nutrition ranked lowest, and satisfaction with their fellow travelers ranked the highest. Their study suggested that increasing municipal services in Mashhad, especially in highly crowded tourist areas, on top of improving nutrition and sanitary state around the city, is very important (18).

**Table 4.** The main health and medical issue during the trip. N(%)

1	Dirty restrooms in the city	193(16.48)
2	Dirty public spaces and low access to trashcans nearby the holy shrine during the peak of travels	128(10.93)
3	Low quality of Religious Tents (Mookebs, Hotels, Inn, ...) based on their rating in Mashhad in the city	102(8.71)
4	Insufficient access to restrooms and drinking water on the roads	73(6.23)
5	Dirty public spaces around the holy shrine and throughout the city	74(6.32)
6	Low quality of walking pathways in the city	68(5.81)
7	Low quality of foods in Religious Tents(Mookeb), Hotels, Inn, ...	65(5.55)
8	Lack of hygiene in the accommodation of pedestrians	58(4.95)
9	High cost of accommodation, food, and rental car in peak travel time	57(4.87)
10	Insufficient access to drinking water	47(4.01)
11	No access to restrooms for people accommodated in Religious Tents (Mookebs')	42(3.59)
12	Train/Railway problems (the broken and filthy bathrooms in trains, lack of appropriate ventilation)	34(2.90)
13	Medical problems (low access to medication and bandage materials, failure to handle on time by the emergency 115 service personnel)	13(0.01)
14	Others	230(19.64)
	Total	1184(100)

The result of our study is consistent with this since the smell of garbage at public places around the Holy Shrine and around the city was reported. This may be due to a shortage of municipal cleaning staff during the days of the end of Safar and other holidays, including Shaaban. The supply of enough drinking water and trash cans around the city needs more supervision by the municipality, which requires attention from policymakers to allocate funds.

Ganji et al. evaluated the schools in the second district of Arak and reported that 37% of schools were in an appropriate state of security (19). In a study conducted by Zazouli et al., it was indicated that more than 99% of city schools and more than 95% of village schools had access to clean drinking water (20). In the study by Najafi et al., titled "Evaluating the Hygiene Status of Mosques in Qom," it was indicated that the state of mosque pantries was ranked as average, and 50% of mosques had bathrooms (21). In the current study, the lack of enough bathrooms for pilgrims accommodated at the mosque was an important problem.

In the years 1394-1395, in a descriptive study, the state of environmental health in public places like 649 mosques, 552 schools, and 250 hair salons in Babol was evaluated and analyzed using a standard checklist through direct inspection and observations. The results showed that 299 mosques (46%) were in an optimal state of environmental health. Environmental health of schools from a security and engineering standpoint showed that 509 schools (2.92%), 519 bathrooms (94%), 506 bathrooms (7.91%), 538 garbage disposals (4.97%), and 505 sewage disposals (4.91%) were in an optimal state. Of the hair salons evaluated, 45 (18%) were flawless and had no sanitary or construction problems. From a health standpoint, 36 hair salon buildings (4.14%) lacked appropriate ventilation, 26 buildings (4.10%) did not meet the criteria for safe construction and there were significant differences between the sanitary state of drinking fountains, drinking water, school security and garbage disposals between city and village schools ( $P>0.05$ ).

### **Strengths and limitations**

The current study is the first study that evaluates the satisfaction rate of pilgrims of the holy shrine of Imam-Reza with health and medical services. Another strength of this study was the large number of participant pilgrims (6497 people). Also conducting the study at different social classes was another strength and both pilgrims on foot and pilgrims using airplanes, trains or cars were included in the study. Limitations of the quantitative study included the following:

**1. Internet Blackout:** Administrative management of the study through WhatsApp was not possible due to internet outage and sometimes there were issues with sending text messages or calls on the phone. Although an online form was designed, it was not used due to an internet outage, and it is necessary for future studies to design offline forms.

**2. Airport Security:** Since the airport is under stricter security control than any other transportation system, when conducting a study, arrangements with the general manager and airport security need to be made at least 3 weeks in advance to arrange a room for interviewers to stay at. Due to time constraints in conducting this study, room for interviewers to stay was not mentioned in the collaboration request letter to the Director General of the Airport. The airport terminal office did not allow the administrative team to stay at the airport. Therefore, interviewers could only interview pilgrims standing in the exit line of domestic flights.

**3. Lack of Arrangement with Basij:** Basij employees working at Basij Square notified the interviewers who were talking to pilgrims to complete the questionnaires, and caused the interviewers to worry. It is suggested that necessary arrangements be made a few weeks in advance for future studies.

### **Suggestions**

According to the results of this study, general suggestions to improve pilgrim access to healthcare services at the end of Safar are mentioned in Table 5.

### **Conclusion**

The results showed that 42.7% and 46.9% of pilgrims rated the access quality to medical and pharmaceutical services as below average.

**Table 5.** Some suggestions to solve the problems of pilgrims' access to health and medical services at the end of Safar.

Suggestions	
<b>Increased collaboration and supervision of the Mashhad Municipal Organization, especially during peak travel times on:</b>	bathroom cleaning Increasing the number of bathrooms around the city Increasing the service staff to clean public spaces around the holy shrine and around the city during the peak of travels Increasing the number of trash cans Collecting trash at the right time around the city Create an appropriate space for pregnant and breastfeeding women Supply drinking water around the city and improve the quality of walking pathways
<b>Increased collaboration and supervision of the hotel owners' union and restaurants of the Mashhad union, and also the taxi organization, on:</b>	Control the cost of accommodation, food, and rental car during peak travel time Supply quality accommodation (hotel, inn) based on their rating
<b>Increased collaboration and supervision of the railway department, especially during peak travel times on:</b>	fixing the broken and filthy bathrooms in trains Lack of appropriate ventilation
<b>Increased collaboration and supervision of Mashhad University of Medical Sciences, especially during peak travel times on:</b>	Supply medication and dressing equipment Emergency staff show up at the bedside of the patient at the appropriate time

Pilgrims by 1.4 % received emergency medical services during their trip, of which 54.9% had less than average satisfaction. The current study is the first one to assess the pilgrims' satisfaction with health and medical services. Regarding the low satisfaction of pilgrims with the services during the peak of travel in the city, it is necessary to improve the healthcare system services to empower pilgrims to access better healthcare.

### Acknowledgement

We would like to thank the Mashhad University of Medical Sciences Research Council for their financial support in conducting the pilgrim study. Also, the authors of this article would like to thank all the pilgrims who participated in this study. We thank all Mashhad University of Medical Sciences directors, including the Director of Public Relations in Mashhad University of Medical Sciences, Vice President of Health in Mashhad University of Medical Sciences, Mashhad's Director General of Railways, Vice President of Healthcare in Mashhad University of Medical Sciences, Mashhad General Director of Airports, and President of the Education Department in Khorasan Razavi, for their collaboration. It is important

to note that the train station collaborated very well with the administrative team, so much so that they gave the study to the administrative team of the pilgrim study, and we sincerely thank the train station security for their genuine collaboration.

### Funding

The study was supported financially by Mashhad University of Medical Sciences (ID: 4011079).

### Ethics approval

The study protocol was approved by the Ethics Committee of Mashhad University of Medical Sciences (Ethic Number: IR.MUMS.REC.1401.207).

### Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

### Conflict of Interest

The authors declare no conflict of interest.

## References

1. World Health Organization. Declaration of Alma-Ata. World Health Organization. Regional Office for Europe; 1978.
2. Committee on Quality of Health Care in America. Crossing the quality chasm: a new health system for the 21st century. National Academies Press; 2001 Jul 18.
3. Renzi C, Tabolli S, Picardi A, Abeni D, Puddu P, Braga M. Effects of patient satisfaction with care on health-related quality of life: a prospective study. *Journal of the European Academy of Dermatology and Venereology*. 2005 Nov;19(6):712-8.
4. Tsai TC, Orav EJ, Jha AK. Patient satisfaction and quality of surgical care in US hospitals. *Annals of surgery*. 2015 Jan 1;261(1):2-8.
5. Doyle C, Lennox L, Bell D. A systematic review of evidence on the links between patient experience and clinical safety and effectiveness. *BMJ open*. 2013 Jan 1;3(1):e001570.
6. Al-Abri R, Al-Balushi A. Patient satisfaction survey as a tool towards quality improvement. *Oman medical journal*. 2014 Jan;29(1):3.
7. Coulter A, Cleary PD. Patients' experiences with hospital care in five countries. *Health affairs*. 2001 May;20(3):244-52.
8. Aziz MM, Ji W, Masood I, Farooq M, Malik MZ, Chang J, et al. Patient satisfaction with community pharmacies services: a cross-sectional survey from Punjab; Pakistan. *International journal of environmental research and public health*. 2018 Dec;15(12):2914.
9. Ford RC, Bach SA, Fottler MD. Methods of measuring patient satisfaction in health care organizations. *Health care management review*. 1997 Apr 1;22(2):74-89.
10. Al-Arifi MN. Patients' perception, views and satisfaction with pharmacists' role as health care provider in community pharmacy setting at Riyadh, Saudi Arabia. *Saudi Pharmaceutical Journal*. 2012 Oct 1;20(4):323-30.
11. Kruk ME, Freedman LP. Assessing health system performance in developing countries: a review of the literature. *Health policy*. 2008 Mar 1;85(3):263-76.
12. Batbaatar E, Dorjdagva J, Luvsannyam A, Savino MM, Amenta P. Determinants of patient satisfaction: a systematic review. *Perspectives in public health*. 2017 Mar;137(2):89-101.
13. Voas D, Storm I. National context, parental socialization, and the varying relationship between religious belief and practice. *Journal for the Scientific Study of Religion*. 2021 Mar;60(1):189-97.
14. Maynard E, Gorsuch R, Bjorck J. Religious coping style, concept of God, and personal religious variables in threat, loss, and challenge situations. *Journal for the scientific study of religion*. 2001 Mar;40(1):65-74.
15. Akthar N, Nayak S, Pai Y. Determinants of patient satisfaction in Asia: Evidence from systematic review of literature. *Clinical Epidemiology and Global Health*. 2023 Sep 1;23:101393.
16. Bolarinwa OA. Principles and methods of validity and reliability testing of questionnaires used in social and health science researches. *Nigerian postgraduate medical journal*. 2015 Oct 1;22(4):195-201.
17. Fink A, Litwin MS. How to measure survey reliability and validity. Sage; 1995.
18. Akbari H, Ghahreman A, Mazhari M. Meta-analysis of researches conducted in the field of travel satisfaction. *Iranian Journal of Social Studies*. 2013;6(3-4):27-44.]
19. Ganji M, Hashemianfar A. The survey of School Circumference Hygiene in Area 2 Arak City and thatâ s. *Journal of Applied Sociology*. 2009 Dec 22;20(4):103-34.
20. Yousefi M. Investigating the Environmental Health and Safety Indices among Schools in Mazandaran Province, Iran. *Journal of health research in community*. 2015 Jun 10;1(1):28-34.
21. Najafi M, Mohammadikhah Z, Mahmudian MH. Investigation of Environmental Health Status of Mosques in Qom City in 2008-2009. In 13th National Congress of Environmental Health 2010.
22. Aghalari Z, ASHRAFIAN AH, Mirzaei M, Lalehi D, Jafarian S. The survey of environmental health in public places of babol in 2015-2016: A short report.

## Supplement 1

### Health Assessment of Pilgrims at the End of the Safar Lunar Month

#### Satisfaction with Medical Services

1. Did you need medical services during this trip?  
**Yes**  **No**  (If yes, please answer the following questions)
2. The quality of medical services accessibility  
**Excellent**  **Good**  **Average**  **Poor**  **Very poor**
3. The quality of pharmaceutical services accessibility  
**Excellent**  **Good**  **Average**  **Poor**  **Very poor**

#### Satisfaction with Emergency Medical Services

1. Did you receive any Emergency Medical Service in case of health-related issues?  
**Yes**  **No**
2. If yes, how did you receive this service?  
**Visit the emergency medical service station in person**   
**Emergency ambulance service on the road**   
**Calling 115 (Emergency Medical Service)**
3. How would you rate your experience?  
**Poor**  **Fair**  **Average**  **Good**  **Excellent**
4. Were the EMS staff quick to respond to your medical care request?  
**Yes**  **No**
5. Based on your complete experience with Emergency medical service, how satisfied are you with the way the emergency personnel deal with you and your companion(s)  
**Not at all satisfied**  **...Dissatisfied**  **... neither satisfied nor dissatisfied**  **... satisfied**   
**... completely satisfied**  **...**
6. In case of transfer to the medical center, was there an emergency medical technician (EMT) beside the patient?  
**Yes**  **No**
7. Are you satisfied with the initial treatment performed by the EMS personnel?  
**Not at all satisfied**  **...Dissatisfied**  **... neither satisfied nor dissatisfied**  **... satisfied**   
**... completely satisfied**  **...**

#### Satisfaction with Health Services

1. Restaurants' Hygiene in the city:  
**Excellent**  **Good**  **Average**  **Poor**  **Very poor**
2. Religious Tents' (Mookebs') Hygiene in the city:  
**Excellent**  **Good**  **Average**  **Poor**  **Very poor**
3. Accommodation's Hygiene in the city:  
**Excellent**  **Good**  **Average**  **Poor**  **Very poor**
4. Toilet's Hygiene in the city:  
**Excellent**  **Good**  **Average**  **Poor**  **Very poor**