Identifying and Ranking Health Tourism Development Barriers in Iran Using Fuzzy VIKOR Method

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Abstract

The present research is an applied study which employed a descriptive-correlation method. After a review of the related literature and survey of opinions of health tourism industry experts, the considered criteria in evaluation and ranking health tourism barriers were determined. Subsequently, 4 criteria (price, quality, accessibility, and proper time) were selected as the most important criteria. Using purposeful sampling method, out of cities and regions with health tourism attraction, four cities were selected as the most important cities with health tourism attraction. Using Fuzzy VIKOR method, quality was found to be the highest importance and proper time was determined as the lowest important criterion. Among sub-indices, improper medical quality was found to have the highest importance (weight). Among the selected cities, Mazandaran was found to have the highest priority. Shiraz, Tabriz and Mashhad, then, had the highest importance, respectively, in terms of health tourism development barriers.

Keywords: tourism, health tourism, Fuzzy VIKOR

1. Introduction

Generally, a travel with at least one night residence in destination is called a tourism travel. This definition is an arbitrary definition and several matches have been performed to present a comprehensive definition for tourism, but all have failed (Rahnama, 2002).

1.1 Health Tourism

There are various definitions for health tourism:

1. Trips which people take in order to benefit from climatic change (with a medical purpose), use mineral waters, convalesce from an illness, receive therapy, and so forth (Rezvani, 2000). Most patients also refer to important medical centers in developed countries with high healthcare facilities. This kind of tourism is highly common and frequent (Mahalati, 2001).

2. According to World Tourism Organization (WTO), health tourism is using services which improve or increase health and spirit of people (through mineral waters, climate or medical interventions) and is performed out of the residential place for more than 24 hours.

3. Travelling from one country to another country to receive medical services in hospitalization unit or outpatient department including:

a. Outpatient services, such as checkup, disease diagnosis, etc., which can be provided for less than 24 hours.

b. Hospitalization services which take a time longer than 24 hours (legal office of health ministry, health tourism law)

One of the most important goals of health tourism is to travel to retrieve power (Heraheshe, 2000). WTO particularly defined health tourism as the use of health tourism in using services which improve or increase health and spirit of people (through mineral waters, climate or medical interventions) and is performed out of the patient's residential place for more than 24 hours.

The United Nations Conference on Trade and Development (UNCTAD) defines those patients who travel to seek medical services in foreign countries as follows:

Individuals who seek certain specialist surgeries and remedies due to the lack of advanced technology in their own countries; individuals who travel to seek medical services in well-known medical institutions; individuals who travel to pass their convalescence; people who travel to use natural facilities such as warm waters; people who travel to receive medical treatments; people who travel to receive light remedies or dentistry remedies due to lack of access or lower price. All these patients are considered tourists (Bookman & Bookman, 2007).

1.2 Various Types of Health Tourism

Health tourism includes medical tourism, curative tourism and preventive tourism.
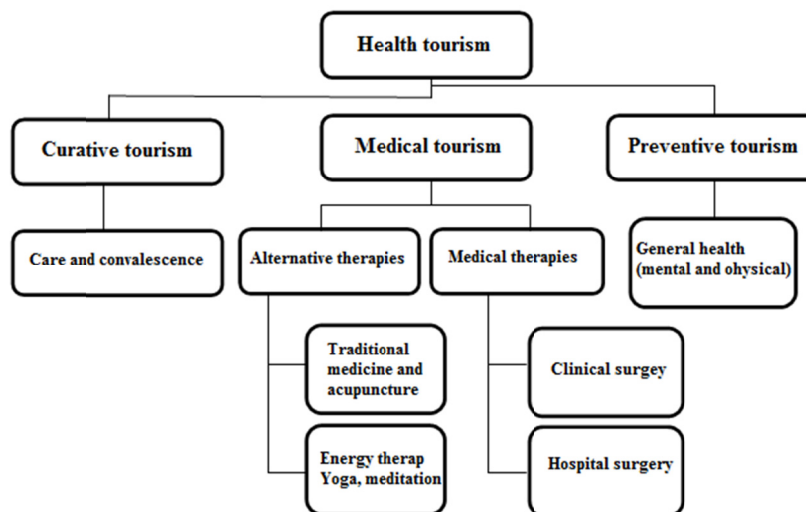

Figure 1. Health tourism classification (TRAM, 2006, p. 30)

Medical tourism: refers to travel for a certain therapy or operation in hospitals or medical centers outside a country (for an average time of 2 weeks) (Heraheshe, 2002).

There are medical interventions in medical tourism. To solve their medical problems, patients (with chronic or acute diseases) either use conventional medical methods or methods which are called non-scientific methods by empirical scholars (TRAM, 2006).

Curative tourism: this kind of tourism is also called therapeutic tourism. In this type of tourism, patients use natural facilities such as warm and mineral waters, salt lakes, medical sludge, radioactive sands, herbal baths, sun, climate, etc. patients (tourists) travel with the aim of receiving therapy or removing physical failure (during a 2-4 weeks interval) and may stay for months.

Additionally, patients who are passing their convalescence can also accelerate their improvement through care program considered by doctors and use natural facilities (Heraheshe, 2002).

Preventive tourism: this type of tourism is highly similar to curative tourism. The only difference between the two tourisms is that in preventive tourism, tourists have no certain disease but they want to prevent the incidence of mental and physical problems (Heraheshe, 2002).

1.3 Health Tourism in Iran

According to World Bank classification, Islamic Republic of Iran is a higher-income developing country, the 4th biggest country in the Asia, the 17th biggest country in the world, with an area of 1.648195 km^2. Iran is located in the Middle East and is considered to be in the East Mediterranean region of the Middle East in WHO classification. Health tourism is not considered as a new phenomenon in Iran. In the past, residents of neighboring countries, especially Arabic countries around the Persian Gulf, traveled to Iran to receive healthcare services (Tourani et al., 2010). At the present, the main cause of patients' travel to Iran is the quality of health services, low costs of medicines and therapy compared to other countries of the region, access to new and advanced health services and equipment, skillful health specialists, similar culture and language, or lack of specialist workforce and equipment in most of the source countries (Jabbari, 2009). According to physical and historical documents and visitors opinions, Iran is a country whose tourism attractions are undeniable and

wonderful. The presence of some natural endowments as rich and natural heritages and unique manifestations of ecotourism can greatly completely transform Iranian tourism (Eftekhari, 2010). Given the cultural, historical and natural attractions, Iran is placed in top 10th countries of the world (Beygi Firouzi, 2011). Based on 20-year perspective evidence at the end of the fourth plan, tourist attraction should have reached 2.6 million people and its income should have reached to 3.2 milliard dollars. However, with respect to the existing statistics, this part of the fourth plan not only was not actualized, but it seems that the considered objectives are very ambitious in 20-year perspective of Iran with respect to tourism conditions of the country (Qolizade, 2010). Today, many countries have focused on various orientations of tourism such as medical tourism. Asian countries such as India, Singapore, Southern Korea, and Malaysia absorb 1.3 million medical tourists all together and this number is increased every year. Among Islamic countries, Dubai, Jordan, Bahrain, and Lebanon are the main medical tourism centers. United Arabic Emirates also seeks to establish medical tourism industry in the region. Employing German physicians and following standard medical skills, Dubai has been able to achieve a good brand. Although among Islamic countries, Iran has the highest capacities and capabilities in health tourism in the area after Jordan, Iran has not been able to make perfect use of its skillful physicians in different specializations (Rokni et al., 2010).

1.3.1 The Effects and Functions of Health Tourism Development in Iran

Regarding medical tourism, either natural or medical, one can observe direct effects at high economic, social and cultural levels in the country which cause a promotion in various levels in various scopes. Economically, medical tourism causes absorption of foreign currency, an increase in life level, an augmentation of national per capita, an increased simulation in production, and a direct and indirect distribution and creation of jobs and various services in the country, such that, for each tourist, 8 jobs including 3 direct and 5 indirect jobs will be created (Kargar, 2007). Culturally and socially, it causes exchanges, motivation, demands and needs derived from the culture of the community. Prosperous medical tourism in Iran will give rise to cultural exchanges between foreign countries and Iran.

1.3.2 Factors Influencing Health Tourism Development

The following model has been confirmed by governmental and private sectors actively working in the medical tourism business scope. In this model, three providers of health and care services, tourism services and health tourism services at micro level; inter-sectoral entity related to all the three health tourism scopes at micro level, and inter-sectoral entity related to all the three scopes at macro level have been propounded (Jabbari, 2008).
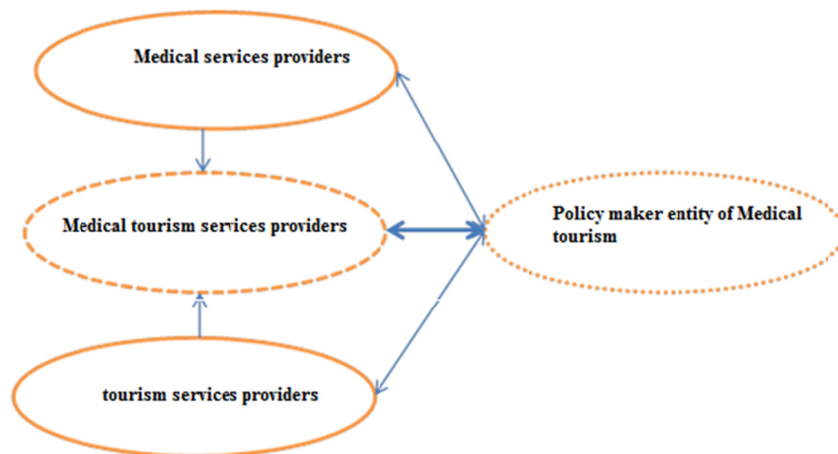

Figure 2. The model showing the relation between effective factors of medical tourism (Jabbari, 2008)

Given the model above, four types of indices with various natures are involved in medical tourism development (Bayati et al., 2011):

1. Cross-sectoral indices related to the policy maker entity
2. Indices related to medical service providers
3. Indices related to medical tourism service providers
4. Indices related to tourism service providers

Accordingly, with respect to the related literature and the opinions of the experts, the factors contributing to measurement of each of these indices in medical tourism development are as follows:

- Cross-sectoral indices related to the policy maker entity:

    1. The presence of rich, policy maker, organizer, and supervisor cross-sectoral entity
    2. Infrastructures of providing after-therapy improvement services
    3. Proper selection of medical tourism's target market
    4. Complete coordination of entities associated with medical tourism
    5. Providing the Atlas of existing medical tourism
    6. Making a brand for Iran in the area of therapy
    7. Formulating medical tourism marketing strategies at micro and macro levels
    8. Designing an internal information system to control social sensitivities
    9. Creating and supporting non-governmental entities such as associations to supervise the performance of operators, active interference in policy making process, etc.
    10. Creating facilities for active sets in medical tourism industry
    11. Identifying relative advantages of medical poles of the country

- Indices related to medical service providers

    1. Appropriate access of foreign patient to required medical services (hospitals, equipped centers, etc.)
    2. Obtaining international quality accreditation (JCI) by hospitals and medical centers
    3. Education and reference system of professional medical personnel
    4. Recoding, controlling and survey system for cured foreign patients

- Indices related to medical tourism services providers

    1. A specialist system of referring foreign patients
    2. The presence of various service packages (supplemantary goods basket) for foreign patients
    3. the process of receiving service and the possibility of detecting therapeutic stages of foreign patients
    4. developing human force (trained medical personnel, having good knowledge of patients' language, skillful in social relations)
    5. The presence of service quality standards (medical and tourism)
    6. Designing an optimal balance system of beneficiaries of medical tourism scope of the country (Beygi Firouzi, 2011)

- Indices related to tourism service providers

    1. The information about medical centers, surgeons, etc.
    2. The access and possibility of using distribution channels and international sales
    3. The presence of infrastructures of accepting foreign passenger
    4. The process of receiving Visa (for medical purposes)

In the following discussion, there are some instances of previously conducted studies in this regard.

Izadi (2012) investigated health tourism status and determined special advantages for Iran. As he reported, Iran has numerous advantages such as experienced and skillful physicians, modern technology and natural medical regions to attract health tourists. It has, however, some weaknesses such as inappropriate coordination between organizations in charge of medical tourism and inappropriate planning. Houshmandi (2012) investigated the potentials of medical tourism in dry and semi-dry regions of Iran. He concluded that some factors such as sun radiation more than 300 days in a year, warm and mineral water springs, hot sand hills, therapeutic mineral soils, evaporative salts and sediments, salt caves and sludge with healing property can lead to the attraction of tourists, increase entrepreneurship and remove poverty in these regions. Viladrich (2014) explored the role of e-marketing in health tourism development in Argentina for reconstructive surgeries. In his study, he observed that in

Argentina, besides health tourism services, tango dance is one of the factors attracting tourists to this country. Given the importance of the issue, the research questions addressed in the present study can be stated as follows:

The main research question:

What are health tourism barriers in Iran?

Secondary research questions:

1. To some extent health tourism development barriers in Iran are important?
2. To what extent sub-indices of each health tourism development barrier in Iran are important?
3. What are the most important cities of Iran in terms of health tourism development barriers?

2. Methodology

The present research was an applied study which used the descriptive-correlation method. First, the related literature was reviewed and the opinions of 12 health tourism industry experts were surveyed, and then the considered criteria in evaluation and ranking health tourism barriers were determined. Finally, 4 criteria were selected as the most important criteria. Using purposeful sampling method, out of cities and regions with health tourism attraction, four cities were selected as the most important cities with health tourism attraction. The most important criteria considered in this study are as follows:

Price:

- Unreasonable cost of therapy
- Not providing drug in accordance with universal prices
- Arbitrary determination of medical tariffs by doctors
- Not offering insurance to health tourists

Quality:

- Low-quality therapy
- Personnel's lack of sufficient knowledge
- Lack of friendly and polite behavior with patient by hospital personnel
- Lack of welfare facilities such as residential complexes for patient companions

Accessibility:

- Lack of easy access to medical centers
- Lack of kitchens equipped with menu
- Lack of interpreters with good command of English or target language
- Lack of desirable and broad air travel
- Lack of possibility of international communications for patients (telephone and internet)

Proper time:

- Not investigating hospitalization affairs in the shortest time possible
- Not responding to electronic demands in the shortest time possible
- Not prioritizing patient admission based on acuteness of disease
- Not performing therapeutic stages in proper time

To rank the health tourism development barriers as well as rank the four selected cities, we employed Fuzzy VIKOR method.

2.1 Fuzzy VIKOR Method

Fuzzy VIKOR method is an adaptive MADM method developed by Opricovic and Tzeng (2002). They developed this method based on LP-metric method.

$$L_{Pi} = \left\{ \sum_{j=1}^{n} \left[w_i (\mathcal{F}_j^* - \mathcal{F}_{ij}) / (\mathcal{F}^* - \mathcal{F}_j^-) \right]^p \right\}^{\frac{1}{p}}$$

$$1 \le p \le +\infty; i = 1,2,\dots.I.$$

This method can provide a collective desirable maximum value for majority and a minimum individual effect for opposites. The stages of this method are as follows:

Computing normalized values: suppose that there are m alternatives and n criteria. Various alternatives have been determined as xi. For the alternative xj, the rank j[th] has been determined as xij and for other alternatives, xij is the value and j[th] the criterion.

In the so-called method, linear normalization is used to make decision matrix dimensionless. This will be done in computational formula of the studied method.

Determining the best and the worst value: the best and the worst of each value in each criterion are identified and called f_j^* and f_j^-, respectively.

$$\mathcal{F}_j^* = Max\mathcal{F}_{ij}, i = 1,2,\dots,m$$
$$\mathcal{F}_j^- = Min\ \mathcal{F}_{ij}, i = 1,2,\dots,n$$

Where f_j^* is the best positive ideal solution for the jth criterion and f_j^- is the worst negative ideal solution for the jth criterion. If all f_j^* are lined together, we will have an optimal combination with the highest score. It is also true about f_j^-.

Determining weight of criteria: criteria' weight should be computed to determine the importance of their relations. In this regard, the present study will use FAHP method.

Computing the distance between alternatives and ideal solution: this stage of computing the distance of each alternative from ideal solution and then their sum for the final value is performed based on the following relations:

Where Si indicates the ratio of the distance of the ith alternative from the positive ideal solution(the best combination) and Ri indicates the ratio of the distance of ith alternative from the negative ideal solution(the worst combination). The best rank is obtained based on Si value and the worst rank is obtained based on Ri value. In other words, Ri and Si are the same L1i and L.i, respectively, in LP-metric method.

Computing Qi value: for each of *i*s, this value is defined as follow:

$$Q_i = v\left[\frac{S_i - S^*}{S^- - S^*}\right] + (1-v)\left[\frac{R_i - R^*}{R^- - R^*}\right]$$

$$R^* = Min_i R_i \ \text{و} \quad R^- = Max_i R_i \quad \text{و} \quad S^* = Min_i S_i \ \text{و} \quad S^- = Max_i S_i$$

Where, v is strategy weight of the maximum agreed with the criterion or the minimum collective desirability.

Ranking alternatives based on Qi values: in this stage, we rank alternative and make decision based on Qi values computed in the previous step.

3. Findings

3.1 Descriptive Statistics

According to demographic information, 83.4% of the sample composed of males and 16.6% of females. Further, 4.4% of the sample were 20-30 year-olds; 30.6% were 30-40 year-olds; 30% accounted for 40-50 year-olds, and 35% represented above 50 year-olds. Finally, 28.1% of the sample held a bachelor's degree; 46.3% held a master's degree and 25.6% had a PhD or above.

3.2 Inferential Statistics

Table 1 shows verbal statements of the sample as colloquial scales to determine the weight of criteria and sub-criteria.

Table 1. Colloquial scales to determine the weight of criteria and sub-criteria

Extremely more important	Much more important	More important	Less important	Equally important	Linguistic scale
(7,9,11)	(5,7,9)	(3,5,7)	(1,3,5)	(1,1,1)	Triangular fuzzy number

Table 2 shows colloquial scales to prioritize health tourism cities in terms of the presence of health tourism development barriers.

Table 2. Fuzzy number spectrum and linguistic scale to prioritize health tourism cities in terms of the presence of health tourism development barriers

The best	Good	Average	Weak	The worst	Linguistic scale
(7.5,10,10)	(5,7.5,10)	(2,5,5,7)	(0,2.5,5)	(0,0,2.5)	Triangular fuzzy number

To weigh the criteria, the geometrical mean of the questionnaires obtained from the triangular fuzzy matrix of paired comparisons and the aggregation matrix of the experts' opinion were obtained (Table 3).

Table 3. Aggregation matrix of the experts' opinion

Proper time	Accessibility	Quality	Price	Health tourism development barriers
(0.87,1.183,1.527)	(0.812,1.106,1.456)	(0.74,0.965,1.265)	(1,1,1)	Price
(0.841,1.224, 1.67)	(0.615,0.901,1.353)	(1,1,1)	(0.79, 1.03,1.35)	Quality
(0.784,1.034,1.342)	(1,1,1)	(0.738,1.109,1.623)	(0.68,0.9, 1.23)	Accessibility
(1,1,1)	(0.745,0.966,1.274)	(0.597, 0.816,1.18)	(0.65,0.84,1.14)	Proper time

In the following paragraphs, the value of fuzzy compound expansion of each of the criteria is computed, and then fuzzy feasibility degree for each possible paired state is computed (Table 4). Also, minimum feasibility degree of each of the criteria relative to other criteria is obtained to compute the weight vector of the four criteria (Table 5).

Table 4. Weight vector of the four criteria

Proper time	Accessibility	Quality	Price	The four criteria
0.829	0.947	0.976	1	The minimum feasibility degree
0.221	0.252	0.26	0.266	The final weight of the criteria

To prioritize the sub-criteria of each of the four criteria, the above stages are performed; therefore, due to great size of computations, each of the sub-criteria is presented as shown in the following table:

Table 5. The final weights of each of the indices

Weight		Indices of each criterion		The final weight of each of indices
Criterion	Weight	Sub-criteria	Weights	
Price	0.226	Unreasonable cost of therapy	0.197	0.052
		Not providing drug in accordance with universal prices	0.185	0.49
		Arbitrary determination of medical tariffs by doctors	0.205	0.054
		Not offering insurance to health tourists	0.211	0.056
		Not providing drug in accordance with universal prices	0.199	0.053
Quality	0.26	Low-quality therapy	0.284	0.073
		Personnel's lack of sufficient knowledge	0.234	0.061
		Lack of friendly and polite behavior with patient by hospital personnel	0.223	0.058
		Lack of welfare facilities such as residential complexes for patient companions	0.257	0.066

Accessibility	0.252	Lack of easy access to medical centers	0.237	0.059
		Lack of kitchens equipped with menu	0.255	0.064
		Lack of interpreters with good command of English or target language	0.249	0.062
		Lack of desirable and broad air travel	0.258	0.065
		Lack of possibility of international communications for patients (telephone and internet)	0.250	0.060
Proper time	0.221	Not investigating hospitalization affairs in the shortest time possible	0.277	0.061
		Not responding to electronic demands in the shortest time possible	0.230	0.021
		Not prioritizing patient admission based on acuteness of disease	0.263	0.058
		Not performing therapeutic stages in proper time	0.227	0.05

Among the barriers, quality has the highest importance and proper time has the lowest importance, and among the sub-criteria, low-quality therapy demonstrates the highest importance (weight). Table 6 shows normalized aggregation matrix of the experts' opinions which has been used to prioritize the cities in terms of health tourism barriers.

Table 6. Normalized fuzzy aggregation matrix of the experts' opinions

Lack of performing therapeutic stages in proper time	Not providing drug in accordance with universal prices	Unreasonable cost of therapy	City
(0.39,0.66,0.90)	(0.42,0.69,0.93)	(0.34,0.59,0..80)	Shiraz
(0.57,0.83,1)	(0,0,0.535)	(0.36,0.1,0.622)	Mazandaran
(0,0,0.558)	(0.53,0.80,1)	(0.36,0.615,0.83)	Tabriz
(0,0.55,0.51)	(0,0,0.493)	(0.30,0.34,00.79)	Mashhad

The values of Ri and Si are as follows:

Table 7. The values of Ri and Si

Ri	Si	
(0.295,0.324,407)	(0.06,0.064,0.064)	Shiraz
(0.255,0.31,0.365)	(0.048,0.054,0.054)	Mazandaran
(0.64,0.647,0.736)	(0.065,0.065,0.065)	Tabriz
(0.579,0.654,0.832)	(0.073,0.073,0.073)	Mashhad

The best and the worst values of Ri and Si are as follows:

Table 8. The best and the worst values of Ri and Si

$\tilde{S}^+$	(0.255,0.31,0.365)
$\tilde{S}^-$	(0.579,0.654,0.832)
$\tilde{R}^+$	(0.048,0.054,0.054)
$\tilde{R}^-$	(0.073,0.073,0.073)

Table 9 shows the prioritization of cities with health tourism in terms of tourism development barriers.

Table 9. The prioritization of the cities

Prioritization	$\tilde{Q}_i$	
2	$(0.271, 0.295, 0.299)$	Shiraz
1	$(0,0,0)$	Mazandaran
3	$(0.67, 0.763, 0.925)$	Tabriz
4	$(1,1,1)$	Mashhad

According to Table 9, Mazandaran has obtained the highest priority in terms of tourism development barriers in this city.

4. Discussion

The quality of medical services highly influences the patients' decision to select their therapeutic destination. Appropriate medical services and facilities and provincial hospitals also can be introduced as one tourism targets for various patients around the world.

After 1995 and after the development of health and care units and the increase in people's access to services, the quality of services in certain dimensions has been considered as one of the important priorities and placed in the agenda of provinces. Executing various designs and pilots in the country, the basic healthcare facilities have been strengthened. However, there are still many deficits in facilities and equipment appropriate with modern technologies and global standards. Modifying these items is necessary to attract health tourists to Iran from various points of the world. The reputation of successful Iranian physicians in various points of the world and, especially in Arabic countries has made patients hospitalizing in these countries highly need Iranian doctors. Frequent travels to Shiraz for such surgeries confirms this claim. The need for nurses with good knowledge of Arabic languages is obvious since most of patients come from Arab countries. However, given the official statistics and due to the fact that English language is their second language, it will not cause any serious problem due to use of nurses with good knowledge of English. Hospital managers of provinces can increase patients' satisfaction level through training hospital personnel about how to behave with patients as well as through considering welfare facilities for companions of non-native patients such as discounting, shortening residence time, providing services of coordination, travel, residence, transfer, and visit for patients and their companions. It is also suggested to perform some activities regarding establishing marketing offices in target markets, organizing informative travels for journalists in the province, supplying the insurance of medical tourism events and making a brand for a province in the area of therapy. Previously conducted studies have revealed that the presence of welfare and tourism facilities for patients' companions, in addition to medical facilities, is highly important. It is so important that in the article *Tourism management* health tourism attractions have been mentioned in some places under the name of hotel and shelter. This confirms the attraction of medical-tourism phenomenon, which indicates that a calm environment and tourism-recreational facilities are two necessary and adequate conditions to attract medical tourists to hospitals. Accordingly, recreational facilities for passing the recovery period are one of the most important factors for attracting tourist. In the present study, it was observed that welcoming patients and their companions from the arrival time and during the travel was a an important issue for such tourists.

Some recommendations are presented for further studies:

1. Existing health tourism capacities and potentials in Iran
2. Economy and trade from the perspective of health tourism
3. The barrier and strategies for the development and optimization of health tourism
4. The status of health tourism in Iran in comparison to international standards

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