



# Evaluate the Development of Medical Tourism by Cognitive Mapping Technique

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## ABSTRACT

**Aims** This study aimed to investigate and analyze the internal factors affecting the development of health tourism.

**Participants & Methods** The statistical population was the Cultural Heritage and Tourism Organization experts, the managers of travel services offices, and doctors in the field of health tourism. In the beginning, by examining the background of research and library study, the effective factors on health tourism development were identified and extracted. The next stage included semi-structured interviews with some experts in this field in order to identify the main factors and specialize the map. In order to nurture the factors and the relationships between them the Delphi method was continued with 15 experts.

**Findings** Two scenarios were presented; The first scenario results show that if only attention was paid to marketing and advertising, in addition to security, specialized medical staff, and tourist attractions, other factors will also change for the better. However, the second scenario results indicate the low sensitivity of other factors to the number of medical centers. This means that the number of medical centers, regardless of their facilities and up-to-date equipment, cannot attract health tourists to an area.

**Conclusion** The importance of human resources and the capability of the medical staff in the model shows the necessity of this factor in the eyes of health tourists. Specialized human resources seriously influence the effective provision of health services. Human resources are the most important factor in the health system.

**Keywords** Health Tourism; Infrastructure; Cognitive Psychology

## CITATION LINKS

[1] Clustering tourism data for mapping Oman ... [2] TSS (tourism support system) as a new ... [3] Tools and algorithm for concept ... [4] Perceived organizational support, psychological ... [5] The scope of an integrated analysis of trust switching ... [6] Implications of oil price fluctuations for ... [7] Applying an evolutionary growth theory for ... [8] Impact of mobile advertising wearout on ... [9] Using conflict management in improving ... [10] Investigation into waiting time, self-service technology ... [11] The future of health tourism in the ... [12] Natural resources in health tourism ... [13] Beyond the rhetoric of health tourism ... [14] Economic evaluation of health tourism ... [15] Service quality of health tourism in India ... [16] Influence of physical fitness of students on ... [17] Medical tourism: breakthroughs in ... [18] Qualitative inquiry and research ... [19] Medical tourism today: what ... [20] Protective factors for health among ... [21] Using fuzzy cognitive mapping in ... [22] Fuzzy cognitive maps as representations ... [23] How do you perceive environmental ... [24] Fuzzy cognitive maps for futures ... [25] Identifying and ranking health tourism ... [26] The obstacles impeding the development ... [27] Application of best-worst method ... Situation of health tourism in Iran; opportunity ... [29] A study of the effect of advertising ... [30] Identifying and prioritizing effective factors in the ... [31] Determinant Factors on Medical ... [32] Identification and prioritization of factors affecting the development ... [33] Determinant Factors on Medical ... [33] The role of hospital performance assessment ...

## Introduction

Today, tourism is one of the most important and effective economic issues and one of the most important and prominent factors of communication, social, and culture in the world [1]. Indeed, expanding economic, health, security and communication infrastructure in the 21st century has made tourism an inevitable reality in human life [2]. The tourism industry, directly or indirectly, accounts for about 95% of the world's Gross Domestic Product (GDP). It is clear that the ability to attract tourists to the health sector and international health markets depends entirely on internationally guaranteed quality [3].

Tourism transports the tourist's health from the residence to another place to help the patient return to her physical and mental health. Health tourism includes "medical tourism," "real tourism," and "preventive tourism" [4].

Tourism infrastructure is a vital foundation for tourism development. The utilization of tourism facilities, services, and facilities often depends on several travel infrastructure networks. These networks may include transportation, water supply, energy/power, waste disposal, and telecommunications [5]. Infrastructure may be interpreted as soft infrastructure and hard infrastructure. Physical infrastructure such as roads, railways, telephone lines, the Internet, etc., belong to the category of hard infrastructure [6]. However, human infrastructures such as efficient work, knowledge creation, solutions for managing public and corporate systems, political use of good technology, etc., fall into the category of software infrastructures [7-11]. Cognitive mapping is one of the ways of understanding phenomena, as others give meaning to them, and is designed to extract the structure and content of the mental process of individuals with the least possible interventions and biases of the researcher [11-16].

Focusing on the international market is essential in the health tourism process. Politicians and the government play an important role in destinations in the health tourism sector. All factors in the process of health tourism services are an important part of two titles: service quality and business process [17].

A very modern form of health tourism is traveling people abroad to benefit from health services and institutions that are world-renowned in their profession. Every health tourist, three times as much as an ordinary tourist, causes the currency to enter the country.

Medical tourism success depends on informing patients about medical procedures, treatment facilities, tourism opportunities, travel arrangements, and countries of medical tourism destinations [8-10].

The issue of tourism therapy is complex, dynamic, and unstructured. Various factors can be influential in the development of the tourism industry. These factors affect each other and have multiple relationships [15].

This study aimed to investigate and analyze the internal factors affecting health tourism development.

## Participants and Methods

The statistical population was the Cultural Heritage and Tourism Organization experts, the managers of travel services offices, and doctors in the field of health tourism. By examining the literature and experts' opinions, eight variables were identified. This research was conducted by applying and testing theoretical concepts in situations of real problems in the field of tourism, seeking a solution to strengthen the infrastructure of health tourism. Meanwhile, in this research, the existing conditions and relationships between different factors in the field of health tourism infrastructure have been described and interpreted. The process of modeling health tourism infrastructure in this article was done in three steps. Based on the subject literature, content analysis, and semi-structured interviews with experts, the basic conceptual framework of health tourism infrastructure was extracted in the first stage. In the second stage, the mental model of health tourism industry experts was extracted based on semi-structured interviews, and the results were analyzed based on the causal mapping method. The cognitive mapping technique is powerful in modeling and drawing causal maps using the opinion of experts. This method can extract and integrate causal mind maps of experts. Cognitive mapping is similar to the interpretive paradigm in philosophical terms. In collecting and analyzing data, it uses qualitative methodology as well as, to some extent, statistical and mathematical tools of the quantitative method. The study's statistical population consists of experts of the Cultural Heritage and Tourism Organization, managers of travel services offices, and doctors and medical staff with relevant work experience in the field of health tourism. The Snowball sampling method was used for sampling. In several stages, some top experts were identified, and after receiving information, each was asked to introduce other experts. Finally, ten experts from the statistical community were selected to participate in the construction of the model. According to Creswell, 3 to 5 samples were enough in a case study [18].

In the beginning, the effective factors on health tourism development were identified and extracted by examining the background of research and library study. The next stage included semi-structured interviews with experts in this field to

identify the main factors and specialize the map. To nurture the factors and the relationships between them, the Delphi method was continued with 15 experts. As a result, several factors were removed, merged, or added to the list. The basis of the agreement was the meaningfulness of the concepts in the field of health tourism (Table 1).

**Table 1)** List of internal factors affecting the development of health tourism based on experts

Factors	Reference
Quality of medical services	[19, 20]
Ease of traveling and proximity	[21]
Marketing and information	[22]
Specialist medical staff	[22, 23]
Number of medical centers	[24]
Security	[21]
Up-to-date equipment and technology	[19]
The cost of medical services and health	[22]

To evaluate the validity of this research in the qualitative part, the methods of long-term participation and persistent observation, comprehensiveness, peer review or feedback, and member control methods have been used.

Extracting and analyzing the causal map of experts was the second stage of the qualitative modeling process. After coordinating and holding one to two expanded interview sessions with each of the experts based on a pre-arranged framework, the table of factors was again presented to the experts. After final approval by experts, a matrix of factors affecting health tourism development was prepared and presented to experts. Experts showed the relationship between factors and the severity of each factor on the development of health tourism by scoring from -1 to +1. In this way, the matrix was completed, and the mental model of each expert was obtained. Then the causal map of each expert was drawn. To ensure the accuracy of the registration and extraction process of the experts' mental model, the drawn causal map was submitted to the relevant experts for approval. After the mental model of the experts was determined and the initial analyzes were performed on it, the possibility of extracting an integrated causal map for the health tourism development model was investigated, which was done as the following:

1. Investigating the relationship between experts' characteristics (age, gender, work experience, level of education, and type of organization) and indicators of complexity and the scope of their causal map.
2. Investigating the situation of similarity or distance between the causal map of experts. Responding to these cases shows the possibility of integrating expert causal maps to achieve an integrated causal map. Kruskal-Wallis, Human White Ni, and Spearman correlation coefficients have been used to answer these questions.

## Findings

Table 2 shows the integration matrix of experts. The numbers in this matrix show the effect of each variable on the other based on the conclusion of experts.

**Table 2)** The integration matrix of experts.

Factors*	1	2	3	4	5	6	7	8
1	0	0.2	0.5	1	1	0.6	0.25	0
2	0	1	0.7	-0.3	1	0.2	0.2	0
3	0	0.2	-0.5	0.27	0.12	0	0	0
4	0	0	0.2	-0.2	0.3	0.2	0.2	0
5	0	0	0	0.5	-0.2	-0.5	0.1	0
6	0.1	0	0.1	-0.5	-0.2	-0.1	0	0
7	0	0	0	0	0.1	1	0.5	0
8	0	0	1	1	0.5	0.2	-0.5	0

\*Note: The order factors were according to Table 1

After consolidating the opinion of experts, the degree of effectiveness and influence of each factor was analyzed (Table 3). The higher the degree of centrality of the agent, the higher the impact on the agent network.

**Table 3)** Effectiveness and susceptibility of each factor.

Factors	Effectiveness	Susceptibility
Quality of medical services	1.5	2.3
Ease of traveling and proximity	0.7	1.1
Marketing and information	2.1	0.2
Specialist medical staff	1.5	2.1
Number of medical centers	2.2	0.1
Security	4.3	2.5
Equipment and technology	2.3	3.1
The cost of medical services and health	0.1	0

According to Table 3 and evaluating the role of factors in improving the situation of other factors, scenarios have been studied, the results of which were presented in 2 cases. The first scenario results show that if only attention were paid to marketing and advertising, security, specialized medical staff, and tourist attractions, other factors would also change for the better. However, the second scenario results indicate the low sensitivity of other factors to the number of medical centers. This means that the number of medical centers, regardless of their facilities and up-to-date equipment, cannot attract health tourists to an area.

As seen in Figure 1, the geometric shape used as a symbol of each factor was different in size. The reason for this was the difference in the importance of each factor in the model. In other words, by observing the presented graph, the factors can be prioritized in terms of importance. Based on fuzzy cognitive mapping analysis results, the number of medical centers and marketing were the most affected. The high impact of the number of medical centers compared to other effective factors shows that if health tourism was developed, it would increase the number of medical centers in that area. This factor can play a great role in creating any kind

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eyes of health tourists. Specialized human resources seriously influence the effective provision of health services. Human resources were the most important factor in the health system.

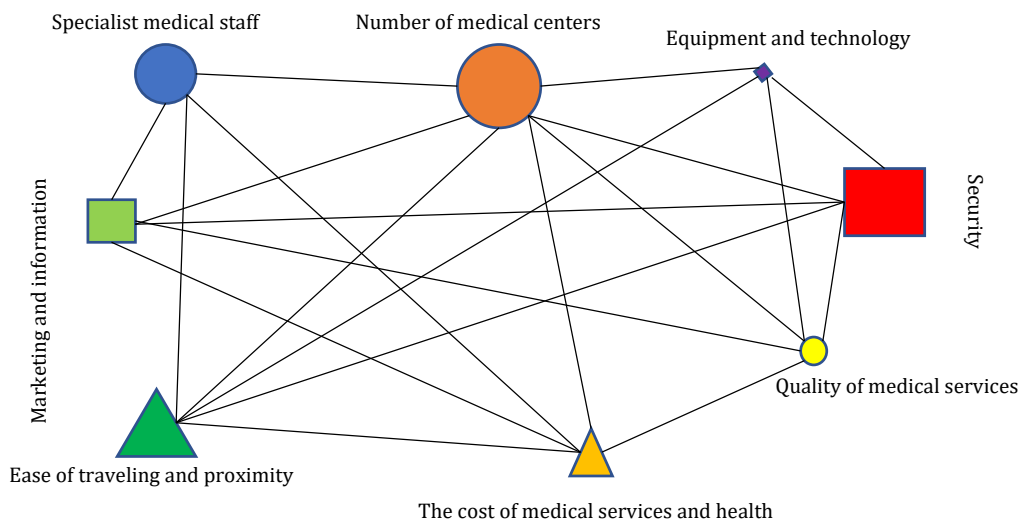


Figure 1) Scenario simulation results on the proposed model

### Discussion

This study aimed to propose a qualitative model to explain the factors affecting the development of health tourism using fuzzy cognitive mapping tools and approaches and social network analysis. The role of these factors in the model has been considered a stimulus for developing health tourism. Health tourism is considered a revenue-generating and competitive industry and a novel field in the tourism sector. Different factors such as marketing are effective in developing health tourism. The findings showed the significance of marketing in developing the health tourism industry. Consistent with our findings, Taghizadeh Yazdi & Barazandeh [25] suggested several measures for developing health tourism, such as setting up marketing offices in target markets, organizing study tours for journalists in the province, and developing a brand for the medical sector. According to Donyadideh's study [26], the absence of advertising in target markets (outside Iran) is an obstacle to the attraction of tourists. Abadi *et al.* [27] argued that the development of medical tourism could be aided by such measures as addressing issues related to medical tourism, promotion in TV programs and local newspapers, and advertising on satellite to introduce the capabilities of medical tourism with set prices and quality medical services and tourism, developing information, and marketing through the creation of tourism-based medical websites for patients to access information, especially because most medical tourists do their research and find information through internet and draft a master

plan for medical tourism. Izadi *et al.* [28] claimed that a lack of interest and professionalism among foreign medical tourists to use international medical capacities stems from ineffective information and poor hospital electronic public information services. Indeed, by recognizing tourists' motivations and professional propaganda and awareness of tourists, health increased the content of health tourism and medical centers. In this way, tourists can be directed to medical attractions.

Azimi *et al.* [29] investigated the effect of advertising on attracting medical tourism and indicated that advertising methods seemed unsuccessful in attracting people with higher education. Therefore, they suggested that advertising practices be revised and novel methods adopted to appeal to a greater range of potential tourists. Therefore, Azimi *et al.*'s findings [29] are inconsistent with our results.

The findings of this study showed the effectiveness of the number of medical centers (effectiveness=2.2; susceptibility=0.1) on the development of health tourism. Although with low effectiveness, the other effective factors in the development of health tourism were specialist medical staff, quality of medical services, and equipment and technology. The lowest effectiveness was found in the factors of ease of traveling, proximity, and security. In this regard, Nili Pour *et al.* [30] indicated the high cost of treatment and medical staff trained and familiar with foreign languages on the development of health tourism, which is different from our findings indicating the high effect of the number of medical centers and marketing. Of course, the difference is



about the priority of the factors, whereas the effect of trained medical staff is considered in our study, too. Specialized human resources seriously influence the effective provision of health services. Therefore, training and using the medical staff optimally increased the quality of health services provided to tourists. This will lead to the satisfaction and return of tourists to the center.

Also, Nili Pour *et al.* [30] considered the significant role of numerous and highly specialized medical centers at the international level in developing health tourism as another effective factor. According to the results of this study, increasing the number of first-class medical centers and hospitals with IPD licenses and international standards can help the faster growth and development of this industry. Increasing the number of medical centers, hospitals, and laboratories prevents patients from wasting time and waiting in long queues and allows physicians and medical staff to respond better to patients.

Maboodi & Hakimi [31] found the high effect of equipment and medical resources on health tourism development. In addition, Karami *et al.* [32] showed the priority of "advanced medical facilities and equipment" and "expertise and skill of doctors and medical staff" in choosing a medical destination from the point of view of medical tourists and experts, which is consistent with our proposed effective factors.

The effective factors on health tourism were a collaboration between sections in macro and operational levels, human resource development, public and health infrastructure development, international credit achievement for healthcare centers in the tourism and health section, and finally, effective advertising, for the tourism industry development in Iran [4, 9, 22, 30] which to some extent is consistent with our findings. While, Mohammadnia *et al.* [33] indicated that the strategies of medical tourism development into executive administrative, legal, political, and promotional approaches, which is not consistent with our findings.

The method presented in this research helps managers have a comprehensive and accurate view of top executive priorities in various fields. This research can be generalized by considering other factors and their relationships and implementing more policies.

## Conclusion

The importance of human resources and the capability of the medical staff in the model shows the necessity of this factor in the eyes of health tourists. Specialized human resources seriously influence the effective provision of health services. Human resources are the most important factor in the health system.

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