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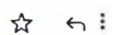
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2	Bukti Konfirmasi Review dan Hasil Review	22 November 2021
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1. Bukti Konfirmasi Submit Artikel dan  
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# Evaluate the Development of Medical Tourism by Cognitive Mapping Technique

## ABSTRACT

Medical travel is not new, but the global nature of the cross-border medical care industry is recent and has developed rapidly. The industry is facilitated by a growing number of internet-based brokerages, linking patients to facilities.

This study uses a mix method approach, where 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.

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.

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*

## Introduction

Medical tourism is market driven—it is shaped by the complex interactions of myriad medical, economic, social and political forces. 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 tourists travel to the four corners of the world for executive health evaluations, ophthalmologic care, cosmetic dentistry and surgery, bariatric procedures, joint resurfacing or replacement, cardiac surgery, organ and stem cell transplantation, gender reassignment surgery and in-vitro fertilization. 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

of improvement in the development of the health tourism industry. 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 were the most important factor in the health system.

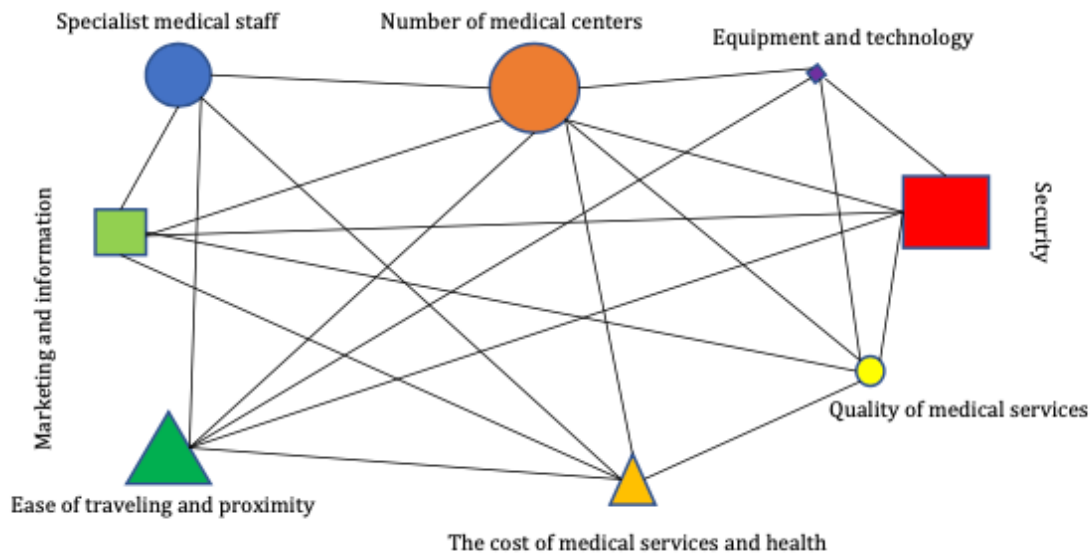


Figure 1) Scenario simulation results on the proposed model

## 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 & Barzandeh [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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**Ethical Permissions:** None declared.

**Conflicts of Interests:** The authors declared no conflict of interests.

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## 2. Bukti Konfirmasi Review dan Hasil Review (22 November 2021)



### Reviewer's Report

<b>Journal:</b>	Health Education & Health Promotion		
<b>Title of the paper:</b>	Evaluate the Development of Medical Tourism by Cognitive Mapping Technique		
<b>Date of the Review completion:</b>	22 November 2021		
<b>Please choose options that can characterize the paper:</b>			
<b>Originality and importance of the paper to the field of research:</b>	High		
<b>The structure of the paper:</b>	Needs to be slightly corrected		
Please tick relevant for the <b>abstract</b>	The abstract provides an accurate summary of the manuscript (including aim, methods, key results and relevance of the study)	<input type="checkbox"/> yes	<input checked="" type="checkbox"/> no
	The abstract contains unnecessary information (please explain)	<input type="checkbox"/> yes	<input checked="" type="checkbox"/> no
	Is the abstract of appropriate size? (150-200 words)	<input type="checkbox"/> yes	<input checked="" type="checkbox"/> no
Please tick relevant for the <b>introduction</b>	Does the introduction identify the purpose of the paper or hypothesis and set the paper within the broader research perspective?	<input type="checkbox"/> yes	<input checked="" type="checkbox"/> no
	The introduction puts the rest of the paper into perspective (explains paper's structure)	<input checked="" type="checkbox"/> yes	<input type="checkbox"/> no
<b>Methods used in the paper:</b>	Contain minor mistakes		
	Does the methodology part allow replicating or reproducing results (to check them or to perform a similar study)?	<input checked="" type="checkbox"/> yes	<input type="checkbox"/> no
	If empirical study: is the sample size large enough and was selected in an appropriate way (leave blank if not acceptable)?	<input type="checkbox"/> yes	<input checked="" type="checkbox"/> no
<b>Results and discussion:</b>	Are the interpretations provided by the author(s) supported by the findings obtained in the study?	<input type="checkbox"/> yes	<input checked="" type="checkbox"/> no
Are there any <b>figures or tables</b> that have to be corrected / deleted?	Yes, some corrections need to be done (please explain)		
	Are the figures and/or tables clear and you can understand their essence?	<input type="checkbox"/> yes	<input checked="" type="checkbox"/> no
<b>Conclusions:</b>	Should be revised		
	Conclusions are supported by the findings, analysis and interpretations of the author(s)	<input type="checkbox"/> yes	<input checked="" type="checkbox"/> no
	Does the conclusion section repeat the abstract of the paper?	<input type="checkbox"/> yes	<input checked="" type="checkbox"/> no
<b>References</b>	Are all references in the list used in the paper?	<input checked="" type="checkbox"/> yes	<input checked="" type="checkbox"/> no
	Are the number, relevance and "age" of the citations appropriate?	<input checked="" type="checkbox"/> yes	<input type="checkbox"/> no
<b>Language of the paper:</b>	Is adequate (small mistakes)		
<b>Length of the paper:</b>	Is appropriate		
<b>What is your main verdict?</b>	Accept paper with majour revisions		
<b>Field for the comments of the reviewer:</b>			
<p>The researcher/s need to improve the abstract part as I did not see the implication of the study as well as some points of the methodology, which is important but is not mentioned, like sample size and population.</p> <p>The introduction section is too long.</p> <p>The significance of the study as well as the research gap is not mentioned by the author. So the author is requested to work on the research gap.</p> <p>The author should include a literature review as separate section.</p>			

The author is requested to attach the output results of SPSS in the results and interpretation parts.

The author is requested to create a conceptual framework to define the variables of the study.

The discussion section requires more studies that can support the findings of the study.

Recommendations and limitations of the study need to be added in this study.

3. Bukti Konfirmasi Submit Revisi dan  
Respon Kepada Reviewer  
(22 Desember 2021)

Dear Reviewer

We thank to reviewer for valuable comments that have helped me to improve the quality of the manuscript. I did our best to address all comments in the revised manuscript. All changes made are highlighted in the revised manuscript by using colored text in MS Word. Here we provide my responses to each comment in the second column of the table. The original referee comments are in the first column

<b>Editorial note</b>	<b>My Responses</b>
<p data-bbox="178 607 868 640">The Abstract</p> <p data-bbox="178 640 868 707">4) The abstract is too short; the appropriate length would be 150-200 words.</p> <p data-bbox="178 707 868 864">5) In order to enhance the readability of the manuscript, please provide in the section «Abstract» more detailed description of the research problem, purpose of the research, methodology used, main findings of the paper, conclusion, relevance of the paper.</p> <p data-bbox="178 864 868 999">6) It is preferable that the „Abstract” contains 1-2 in-text citations of the sources mentioned in the list of references that the research is based on or that the research contributes to.</p>	<p data-bbox="887 607 1377 640">Abstract</p> <p data-bbox="887 640 1377 674">Aims:</p> <p data-bbox="887 674 1377 775">This study aimed to investigate and analyze the internal factors affecting the development of health tourism.</p> <p data-bbox="887 775 1377 808">Participants &amp; Methods:</p> <p data-bbox="887 808 1377 1290">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.</p> <p data-bbox="887 1290 1377 1715">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.</p> <p data-bbox="887 1715 1377 1933">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</p>

	resources are the most important factor in the health system.
<b>INTRODUCTION AND LITERATURE REVIEW:</b>	
7) The paper should be divided into clearly defined and numbered structural parts (1. Introduction, 2. Literature review, 3. Research Methodology, 4. Results, 5. Discussion, 6. Conclusion.); each subsection should be numerated as well. Please, adjust your titles of the sections	<p>Thank you for your suggestion.</p> <p>The manuscript has been adjusted based on your suggestions.</p>
8) We recommend splitting up the section “Introduction” into two different parts: “Introduction” and “Literature review”.	Thank you for your suggestion. We have corrected the section.
9) In the Introduction, is it recommended to indicate literature gap(s), research aim(s) and question(s), the theoretical/conceptual framework applied, relevance and significance of the study, research methodology used, main findings/contributions.	<p>We greatly appreciate the reviewer effort to carefully review the papers and the valuable opinions offered.</p> <p>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].</p> <p>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</p>

	<p>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].</p> <p>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].</p> <p>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.</p> <p>Medical tourism success depends on informing patients about medical procedures, treatment facilities, tourism opportunities, travel arrangements, and countries of medical tourism destinations [8-10].</p> <p>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.</p>
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Journal Name : **Health Education & Health Promotion**  
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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

## 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

of improvement in the development of the health tourism industry. 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 were the most important factor in the health system.

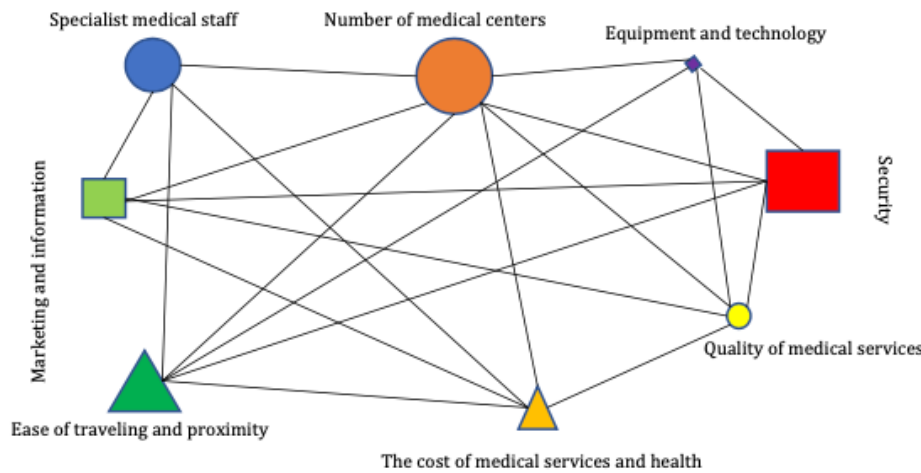


Figure 1) Scenario simulation results on the proposed model

## 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 & Barzandeh [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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