

# Determining destination competitiveness in medical tourism: A study based on AHP-QFD framework\*\*

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## ABSTRACT

### Keywords:

Destination competitiveness,  
Medical tourism (MT),  
Analytic hierarchy process (AHP),  
Quality function deployment (QFD),  
House of quality (HOQ),  
Alanya.

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This study investigates the competitiveness of Alanya, a medical tourism destination in Türkiye, and determines appropriate strategies using the analytical hierarchy process and quality function deployment. Data were collected from medical tourism experts to gain managerial insights into the factors affecting the competitiveness of medical tourism. The findings show that medical tourists primarily focus on medical factors such as competence of doctor and quality of treatment. The main strategies to strengthen competitiveness are to create a healthcare-free zone, to increase the number of accredited health care providers, and to encourage the involvement of doctors in academic research and ongoing training. For researchers interested in assessing competitiveness in medical tourism destinations, the study presents general determinants that should be considered in each destination. In addition, the findings show that each medical tourism destination should focus on its own determinants of medical tourism competitiveness when developing its marketing strategies. Finally, it shows that the analytical hierarchy process and quality function deployment approaches can be successfully applied in achieving destination competitiveness and strategic planning, with content validity and importance performance analysis.

## 1. Introduction


In many industrialized countries, social security and health insurance systems cover many health-related problems and offer free diagnosis and treatment to the inhabitants. However, there may be long waiting times for certain procedures while most systems exclude certain procedures, such as wellness, psychological disorders, and dental and aesthetic issues (Connell, 2006). Additionally, some countries lack access to the latest medical techniques for treating certain disorders while legal and ethical constraints may restrict access to certain surgeries, especially transgender surgery and organ transplants (Cohen, 2015). Consequently, many patients prefer getting medical treatment overseas because of lower costs and waiting times, better care, and opportunities to incorporate fun, relaxation, and leisure activities (Arueyingho et al., 2022; Connell, 2006; Heung, Kucukusta, & Song, 2010; Fetscherin & Stephano, 2016). This is known as medical tourism (MT) (Carrera & Bridges, 2006, Connell, 2006, Bookman & Bookman, 2007, Wongkit & McKercher, 2016).

Having been worth under \$10 billion in 2000 (Zhang et al., 2022, pp. 4), MT is currently estimated to be worth \$45–100 billion and to grow 25% annually over the next decade (Zolfagharian et al., 2018) to reach \$143 billion by


2025 (Roy et al., 2022). Many countries, especially developing ones in Eastern Europe, Asia, and Latin America, have been planning legally and practically to become more competitive so as to benefit from this expanding market (Hunter, 2007; Smith et al., 2011; Zolfagharian et al., 2018; Al-Talabani et al., 2019).

Meanwhile, academic studies have focused increasingly on MT since the 2000s (Temizkan et al., 2015). According to Hoz-Correa et al. (2018), the most important contributors and frequently cited studies include Connell (2006), Bookman and Bookman (2007), De Arellano (2007), Horowitz, Rosensweig and Jones (2007), Carrera and Bridges (2006), and Lunt and Carrera (2010). Previous studies on MT, which primarily analysed the industry from a supply and demand perspective, have proposed various models incorporating push and pull factors to understand medical tourists' decision making. These models and empirical MT research indicate that these tourists are mainly attracted by treatment quality and the competencies of the destination country's physicians, hospitals, and clinics (Smith & Forgione, 2007; Wongkit & Mckercher, 2016; Fetscherin & Stephano, 2016). More specifically, each MT destination has its own characteristics, stands out for particular treatments, and attracts patients from certain countries (Hunter, 2007). Thus, each patient's particular

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requirements may lead them to choose different destinations (Cormany, 2010; Heung et al., 2010), so a destination's competitiveness depends on matching its MT resources with the needs of medical tourists choosing it. Hence, research into MT competitiveness is conducted on specific destinations (Heung et al., 2011; Sultana et al., 2014; Roy et al., 2018), with each study developing destination-specific competitive recommendations based on various methodologies and theories.

Given the differing determinants of MT destination competitiveness, the present study focuses on Alanya in Türkiye, a developing country. The main aim is to identify the factors determining MT competitiveness in Alanya from the perspective of destination competitiveness theory and to make recommendations to strengthen its competitiveness in the multidimensional MT market. By focusing on Alanya, the study also aims to contribute to MT practices in developing countries more generally by providing a conceptual framework for evaluating MT competitiveness in such destinations. The study first uses content validity (CV) to identify the factors determining the competitiveness of all Alanya's MT destinations. Then, it integrates analytic hierarchy process (AHP), importance-performance analysis (IPA), and quality function deployment (QFD) to evaluate Alanya's MT infrastructure, activities, organizations, opportunities, and attractions to address the needs of tourists and improve the destination's attractiveness.

The next sections include a brief literature review followed by the methodology and research design. The findings are then discussed in relation to the literature. Finally, after presenting the conclusions, the study's limitations and directions for further research are discussed.

## 2. Literature review

Since the 1990s, tourism academics have increasingly focused on destination competitiveness (Crouch, 2011). Much of this extensive research has drawn on competitiveness theory, developed by Porter regarding business practices since the 1980s (Crouch & Ritchie, 1999; Dwyer & Kim, 2003) and which synthesizes comparative and competitive advantage (Porter, 1990). In tourism, comparative advantage refers to inherited or endowed resources, such as climate, landscape, flora, and fauna; competitive advantages refers to created goods like tourism infrastructure (Dwyer and Kim, 2003, pp. 372). Destination competitiveness broadly encompasses cross-country price differences caused by currency fluctuations, many aspects of the tourism industry, and various determinants of destination attractiveness (Dwyer et al., 2000). A tourist destination's long-term success and survival therefore depends both on its natural and created endowments, and its ability to use these resources effectively (Crouch & Ritchie, 1999; Karakuş, 2019).

Regarding MT, however, competitiveness determinants are different because of tourists' varying motivational factors, which previous research assessed from a supply and demand perspective. For instance, costs, healthcare quality, accreditation, and physician expertise are important in medical facility selection, whereas regulatory and economic conditions affect the country choice (Smith & Forgione, 2007). Fetscherin and Stephano (2016) developed a two-way model of MT decision-making incorporating push and pull factors. Push factors are those motivating people to prefer medical treatment in a different country to their own; pull factors are the destination characteristics attracting medical tourists to that country over their own, including the country's environment, touristic attractions, and MT prices, facilities, and services.

While such models offer general insights into determinants of medical tourism destination selection process, MT competitiveness theories have been supplemented by destination-specific studies. For example, Heung et al., (2011) examined competitiveness of medical tourism in Hong Kong and determined main barriers through a qualitative research. Sultana et al. (2014) discussed the factors influencing the attractiveness of India with an application of structural equation modelling approach. Wongkit and Mckercher (2016) discovered the desired attributes of medical service for Thailand's most well-known MT destinations, Bangkok and Phuket in a quantitative research. Similarly several studies have also discussed this growing industry in many well-known destinations with different methods (Awang et al., 2015; Ganguli & Ebrahim, 2017; Roy et al., 2018).

Similar to these Asian destination, Türkiye, a developing country, draws many medical tourists recently (Ulaş & Anadol, 2016) and promotes to invest significantly in MT through the Ministry of Culture and Tourism, Ministry of Health, and Ministry of Economy (Fetscherin & Stephano, 2016). The competitiveness of Türkiye in medical tourism has thus been the subject of numerous research in recent years (Tontuş, 2018; Üstün & Uslu, 2022). Although some of these studies focus on Türkiye as a whole, there are also studies conducted in different destinations of Türkiye aiming to promote medical tourism. Antalya (Otamış and Yüzbaşıoğlu, 2015); İzmir (Sayın et al., 2017) and Istanbul (Pekerşen et al., 2021) are among the most important of these destinations. In addition to these destinations, another important destination targeting a wide market share in the world MT market is Alanya. Alanya, a popular summer destination on the south coast of Türkiye, welcomes nearly three million tourists and more than thirty thousand foreign residents, mostly from Northern Europe (Kahveci & Okutmuş, 2017). In addition to its touristic attractions, Alanya provides health and medical services with four hospitals, over 100 oral and dental health centers and many aesthetic clinics. It is also known that Alanya has hosted many medical tourists for many years. In addition,

both resident foreigners and foreign tourists report high satisfaction with Alanya's health services (Yazan, Şengül, & Girgin, 2018). Taking into account all these features of the destination, the stakeholders in the national and local MT supply leg established the Turkish Medical Tourism Federation (TURSAF) in Alanya in 2017. Later, considering the city's MT potential, the federation made Alanya Health Tourism Association (ALSTUD) its administrative center. This development was followed by the establishment of the Health Tourism Research and Application Center (SATUMER) by Alanya Alaaddin Keykubat University in 2020.

The above-mentioned developments increase the possibility of Alanya turning into a competitive medical tourism destination, both nationally and internationally, beyond being a federation center. However, from the perspective of destination management and marketing, it is not possible to determine competitive strategies without determining and analyzing the current situation. No research has been found in the literature that analyzes the competitiveness of Alanya from a stakeholder perspective and proposes specific strategies for increasing the market share of medical tourism. From this point of view, the main objectives of this study are to provide a detailed overview of the current state of the medical tourism industry in Alanya and to present a perspective to industry leaders and decision makers, including factors and suggestions that will increase the competitiveness of the MT industry. In addition, this study will also guide the

path to be followed for development and competitiveness in other MT destinations, using the methods to be explained in detail below.

### 3. Methodology

This study aims to identify the factors affecting the medical tourism destination choices of tourists, evaluate the importance of these factors and the performance of Alanya in terms of these factors, identify the areas where Alanya lags behind compared to its competitors, and present strategies for the development of these areas. Both quantitative and qualitative techniques were used to explore the situation, and to propose strategies within a methodological framework. Incorporating AHP and QFD, and CV and IPA, this study provides the required data accurately. After reviewing the MT literature, CV was implemented to identify the factors that influence medical tourists' destination choices, which will be called as the determinants of MT destination competitiveness in this study. AHP was then used to evaluate the importance of these determinants for Alanya and compare its performance with competitor destinations. IPA was used to identify Alanya's less successful areas, and various strategies were developed by QFD to overcome these deficiencies.

Table 1 lists and outlines the steps followed in this study.

The following headings contain detailed information about the steps in the table and how each method is implemented.

**Table 1. Study steps**

Step	Method	Sample	NoP
1 Determining destination requirements and destination competitiveness evaluation	<b>CV:</b> Evaluation by MT experts of the attributes to determine destination MT competitiveness .	Experts with knowledge and experience in international MT throughout Turkey	13
	<b>AHP:</b> Determining the weighted importance attribute scores determined by experts and Alanya's MT performance against its competitors in terms of related attributes using pairwise comparisons.	MT experts in Alanya	14
	<b>IPA:</b> Evaluation of the areas to concentrate the IPA matrix on SPSS		
2 Determining functional requirements	<b>In-depth interviews:</b> Obtaining suggestions regarding the areas to concentrate indicated by IPA	MT experts in Alanya	14
3 Evaluation of the relationship between destination requirements and functional requirements	<b>In-depth interviews:</b> Correlating the effects of suggestions obtained with expert opinions on the development of the weak areas in the matrix	MT experts in Alanya	8
4 Evaluation of the relationship between functional requirements	<b>In-depth interviews:</b> Correlating the effect of each suggestion on the other obtained with expert opinions in the matrix	MT experts in Alanya	8
5 Determining the priorities of functional requirements	Determining the strategies to strengthen Alanya's competitiveness by evaluating the relations obtained from the matrices		

**Content validity**

CV ensures consistency between the scale to be developed and the feature to be measured. It was first used by Lawshe (1975) to measure workplace performance (Wilson et al., 2012). By evaluating each item in the data set, CV ensures that expressions that strongly represent the subject are included in the scale (Ayre & Scally, 2014). CV defines how many of the experts consulted should evaluate an item as ‘essential’ for that item to reach a sufficient level of validity to be included in the scale (Wilson et al., 2012). For this, a study is conducted in which a sufficient number of expert opinions (between 5 and 40) are obtained (Ayre & Scally, 2014; Yeşilyurt & Çapraz, 2018).

Evaluate the following items as 1- Essential, 2- To be revised 3- Non-essential. You may indicate your suggestions for revisions and the reasons for the removal of the items that you have marked as non-essential next to the item or under the form.		Essential	To be revised	Non-essential
1	i item			

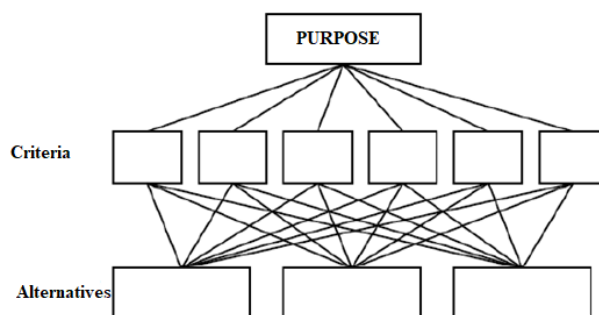
**Figure 1. Evaluation of the items in CV**

Source: Lawshe, 1975, pp. 567

The benefits of CV include controlling the number of items and improving construct validity of the structure that the scale is trying to measure. As a result, a useful scale with sufficient scope can be developed (Yeşilyurt & Çapraz, 2018).

**Analytic hierarchy process**

The limited availability of natural and other resources, which underlies the scarcity principle in economics (Dinler, 2015), forces decision-makers to make choices. Finding solutions to decision-making problems (Carlsson & Fullér, 1996) systematically, consistently, and efficiently became an important field of study during the 1970s, with many models and theories that have become increasingly important (Dyer et al., 1992; Carlsson & Fullér, 1996). The first hierarchical model for solving such problems is AHP, developed by Saaty (Saaty, 1987, pp.161; Carlsson & Fullér, 1996). AHP first identifies the available alternatives and then defines the appropriate criteria for choosing from among them (Saaty, 1990) to enable the optimum decision (Ömürbek & Tunca, 2013; Doğan & Karakuş, 2014). Thus, the model is hierarchical (Figure 2), with purpose above the selection criteria and potential sub-criteria and the alternatives to choose at the bottom (Saaty, 1987, pp.161).



**Figure 2. Three-level AHP model**

Source: Ömürbek & Tunca, 2013, pp.50

To determine the priorities in solving the selection problem, the criteria are weighted through pairwise comparisons to determine relative importance weights that affect decision making (Saaty, 1990; Zhou et al., 2015).

**Table 2. Fundamental scale of absolute numbers**

Importance Value	Definition
1	Equal importance of two criteria
3	Moderate importance of one over another
5	Strong importance of one over another
7	Very strong importance of one over another
9	Extreme importance of one over another

Source: Erbaş, 2016, pp. 99

To compare two criteria, Saaty (2008, pp. 86) developed a fundamental scale of absolute numbers (see Table 2). This defines the importance of criteria *i* compared to criteria *j*. For example, if two criteria contribute equally to the objective then their importance value is 1 whereas if the importance of one criteria over another is the highest possible then the importance value is 9.

However, the expert participants’ evaluations in AHP may be inconsistent (Saaty, 1990). The level of this consistency is measured by the consistency ratio (CR) or inconsistency ratio (IR) (Saaty & Özdemir, 2003), calculated by comparing the number of elements with their eigenvalues ( $\lambda$ ). That is, the reliability of the expert answers is evaluated by detecting inconsistencies (Saaty, 1990, pp.13), with matrices with an inconsistency ratio of 0.10 or lower considered consistent and ratios higher than 0.10 considered inconsistent ( $CR \leq 0:1$ ) (Saaty, 1977).

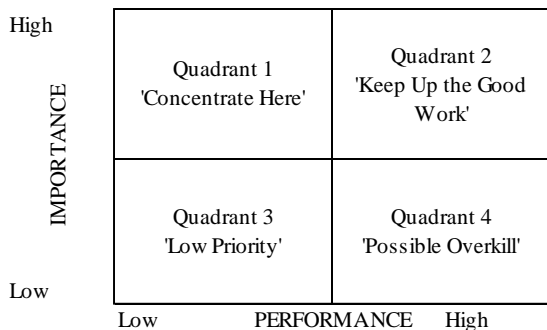
Many studies have used AHP to evaluate tourism planners’ managerial decisions (Crouch, 2011), and measure and improve tourist destination competitiveness (Das & Mukherjee, 2008; Hsu et al., 2009; Zhou et al., 2015; Erbaş & Perçin, 2016). Crouch (2011) provides one of the most important demonstrations of AHP’s utility for evaluating destination competitiveness while other studies have shown that the most important reason for integrating AHP into QFD is to increase measurement precision and objectivity (Das & Mukherjee, 2008; Doğan & Karakuş, 2014; Karakuş & Çoban, 2018).

The data in this study were analyzed using AHP Excel Template Version 2018-09-15, prepared by Goepel

(2013). Therefore, the formulas for AHP data analysis and the detailed calculations are not described here as they can be consulted in other sources, whether by Saaty (1977, 1987, 1990) or other researchers (Das & Mukherjee, 2008; Hsu *et al.*, 2009; Doğan & Karakuş, 2014), or using expert choice (Saaty, 1990, pp. 20).

**Importance performance analysis**

IPA, created by Martilla and James (1977), provides a method used in marketing for evaluating which aspects of a product or service should be prioritized to increase customer satisfaction (Albayrak & Caber, 2011). The method evaluates both each product feature’s importance and performance (Martilla & James, 1977) using a three-stage process. The basic characteristics of the product are first determined through literature reviews, focus group interviews, managerial evaluations, etc. (Oh, 2001) or CV as in this study. Then, the importance and perceived performance of each product or service feature are determined from the customers’ perspective (Martilla & James, 1977). Finally, each feature’s importance and performance values are calculated and presented in a matrix from which the median or mean importance and performance values are calculated to identify where their axes cross (Martilla & James, 1977). These creates four quadrants, as seen in Figure 3.



**Figure 3. Importance-performance matrix**

Source: Albayrak & Caber, 2011, pp. 629

While all four quadrants here have significant implications for product or service providers, for managers wishing to improve competitiveness and success, Quadrant 1 is the most critical because customers consider performance as low for the features they consider most important.

IPA is a simple and easily applicable technique that has been frequently used in tourism research into product and destination development and competitiveness (Oh, 2001; Enright & Newton, 2004; Murali *et al.*, 2016). Studies that combine IPA and AHP integrate them in two ways. One way is to apply AHP to the data set after conducting IPA, then create a hierarchical structure using factor analysis, and finally obtain competitiveness values (Wang

*et al.*, 2016). The other way is to create a hierarchical structure based on data obtained from the literature, and then determine importance and performance values using AHP. Finally, the weighted average values that emerge can be used in the IPA (Erbaş & Perçin, 2016). The second approach is preferred in the present study. Hence, the values that emerged from the IPA provided the data for the destination requirements.

**Quality function deployment**

QFD accurately identifies customer needs and expectations, and incorporates them into designing new products (Tan & Shen, 2000). It can also be used to assess a business’s current position against competitors (Erbaş, 2016). By offering a logical framework for prioritization, QFD eliminates irrational choices. Instead, it transforms them into a useful strategic planning tool (Erbaş & Perçin, 2016). The method is based on the matrix structure called house of quality (HOQ) (Figure 4) (Doğan & Karakuş, 2014, pp. 180), which provides answers to the following questions (Matzler & Hinterhuber, 1998, pp. 36):

1. What are our customers’ requirements?
2. How important are these requirements?
3. How do customers evaluate us against competitors?
4. Which functional requirements meet our customers’ requirements?
5. To what extent do these functional requirements meet our customers’ requirements?
6. To what extent do the functional requirements affect each other?

Regarding HOQ, as shown in Figure 4, the term “customer requirements” was changed to “destination requirements” for this study. In addition, the HOQ did not include a competitive assessment matrix. Instead, the destination requirements on IPA were determined using Alanya’s performance weightings as the areas to concentrate on (Figure 3).

The matrix reveals the relationships between destination requirements and the functional requirements to meet them. As Figure 4 shows, the destination requirements and functional requirements to meet them are determined first. Then, by correlating destination requirements with functional requirements, the importance of each functional requirement for meeting the destination requirements can be ranked. Next, by evaluating the relationship between highly important functional requirements, the potential positive or negative effects they have on each other can be determined (Erbaş, 2016). Finally, a systematic framework can be proposed for the competitive strategies. HOQ offers practitioners a flexible framework because matrices can be deleted or added (Matzler & Hinterhuber, 1998; Wang, 1999; Chien & Su, 2003).

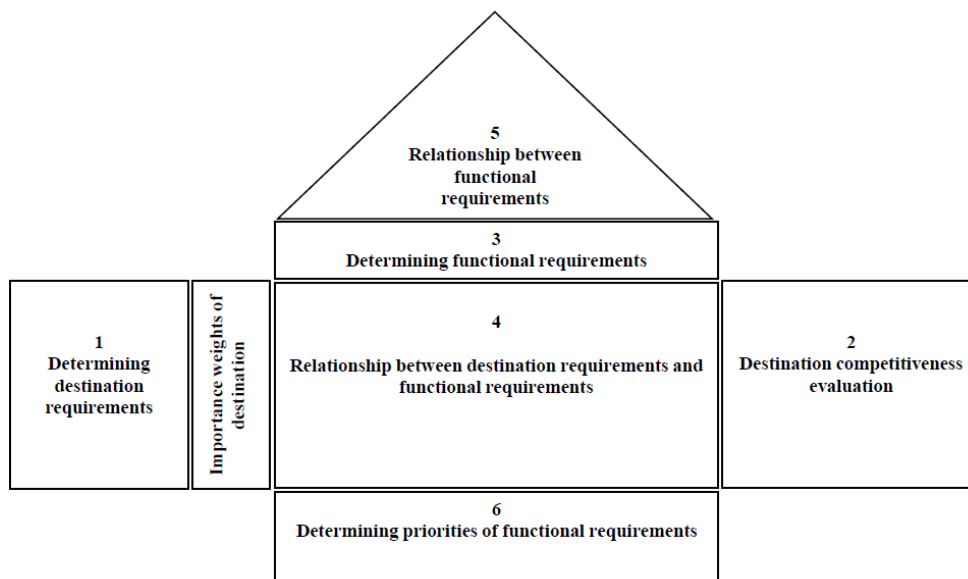


Figure 4. House of quality

Source: Adapted from Matzler & Hinterhuber, 1998, pp 35-36; Wang, 1999, pp. 900; Das & Mukherjee, 2008, pp. 326

QFD was first established in the 1960s during Japan’s quality control and improvement research era before gaining global popularity (Tan & Shen, 2000, pp. 1141). QFD is used in many fields, including product design, planning, decision-making, engineering, management, teamwork, scheduling, and costing (Chan & Wu, 2005, pp. 467), and recognized as a powerful instrument in strategic service planning (Das & Mukherjee, 2008; Doğan & Karakuş, 2014; Erbaş & Perçin, 2016).

for about one hour during HESTOUREX 2019, Antalya Health and Sports Tourism Fair. Each expert was asked to evaluate the factors in the structured data set. The CVR and CVI calculations were then made using Microsoft Excel 2013. Based on the CVR values , 12 items more items with values of 0 or and less than 0 were eliminated. Finally, the CVR critical values in Table 3 were used to select the factors for the data set (Ayre & Scally, 2014; Yeşilyurt & Çapraz, 2018).

4. Results

This study aimed to identify which factors make MT destinations competitive in general before identifying the factors making Alanya successful or unsuccessful. Various competitive strategies were then developed for the unsuccessful areas. The following sections present the data analyses and results.

Content validity results

According to Table 1, the study identified which factors patients consider when choosing an international treatment destination, which determine the competitiveness of MT destinations as the first step. To do so, a data set of 98 items was created by compiling the frequently repeated factors from the literature for international patient motivation and destination competitiveness. Following a focus group interview with three academicians, this number was reduced to 66. To create the CV data set, the opinions of 13 qualified MT experts (see Table 1) were taken to determine the CV of the 66 items obtained from the literature. Here, the selection of the experts to consult is critical (Lawshe, 1975). In the present study, 13 experts were interviewed

Table 3. Minimum/Critical Values of CVR

Number of Experts	Minimum Value	Number of Experts	Minimum Value
5	1.000	23	0.391
6	1.000	24	0.417
7	1.000	25	0.440
8	0.750	26	0.385
9	0.778	27	0.407
10	0.800	28	0.357
11	0.636	29	0.379
12	0.667	30	0.333
13	0.538	31	0.355
14	0.571	32	0.375
15	0.600	33	0.333
16	0.500	34	0.353
17	0.529	35	0.314
18	0.444	36	0.333
19	0.474	37	0.297
20	0.500	38	0.316
21	0.429	39	0.333
22	0.455	40	0.300

Source: Ayre & Scally, 2014, pp. 85

The critical CVR value at  $\alpha=0.05$  significance level was determined as 0.538 for 13 experts. Accordingly, 31 items were selected for the scale. Their average CVR value was 0.6778. Since this was greater than the critical CVR value of 0.538, the content validity of the 31 items could be considered statistically significant (Lawshe, 1975;



**Table 4. Determinants of Destination Competitiveness in MT**

N	CVRcritical	Factor	Reference
1	0.538	Accessibility of destination	Heung <i>et al.</i> , 2010; Aydın & Karamehmet, 2017; Zehrer <i>et al.</i> , 2017; Hoz-Correa <i>et al.</i> , 2018
2	0.846	Safety and security	Dwyer & Kim, 2003; Enright & Newton, 2005; Gomezelj & Mihalič, 2008; Zhou <i>et al.</i> , 2015
3	0.538	Infrastructure facilities	Enright & Newton, 2004; Heung <i>et al.</i> , 2010; Zehrer <i>et al.</i> , 2017; Ganguli & Ebrahim, 2017; Roy <i>et al.</i> , 2018
4	0.538	Positive country image	Crouch & Ritchie, 2003; Fetscherin & Stephano, 2016; Wongkit & Mckercher, 2016; Hoz-Correa <i>et al.</i> , 2018
5	0.692	Waiting time for treatment	Connell, 2006; Horowitz <i>et al.</i> , 2007; Hanefeld <i>et al.</i> , 2015; Hoz-Correa <i>et al.</i> , 2018
6	0.846	Prices of treatment	Heung <i>et al.</i> , 2010; Sultana <i>et al.</i> , 2014; Wongkit & Mckercher, 2016; Fetscherin & Stephano, 2016; Ganguli & Ebrahim, 2017; Al-Talabani <i>et al.</i> , 2019
7	0.692	Quality of medical equipment	Bookman & Bookman, 2007; Cormany, 2010; Gill & Singh, 2011; Fetscherin & Stephano, 2016
8	0.692	Accreditation of treatment / healthcare providers (hospitals and clinics)	Smith & Forgione, 2007; Heung <i>et al.</i> , 2011; Wongkit & Mckercher, 2016; Lunt <i>et al.</i> , 2015; Henson <i>et al.</i> , 2015; Ganguli & Ebrahim, 2017
9	0.692	Competence of doctors	Connell, 2006; Horowitz <i>et al.</i> , 2007; Das & Mukherjee, 2016; Al-Talabani <i>et al.</i> , 2019
10	0.692	Competence of other healthcare professionals	Kotler <i>et al.</i> , 2008; Debata <i>et al.</i> , 2015; Wongkit & Mckercher, 2016
11	0.692	Competence of healthcare providers	Crooks <i>et al.</i> , 2010; Debata <i>et al.</i> , 2015; Fetscherin & Stephano, 2016; Roy <i>et al.</i> , 2018
12	0.692	Quality of treatment	Bookman & Bookman, 2007; Connell, 2011; Lunt <i>et al.</i> , 2015; Das & Mukherjee, 2016; Fetscherin & Stephano, 2016
13	0.538	Patient follow-up services	Horowitz <i>et al.</i> , 2007; Smith & Forgione, 2007; Crooks <i>et al.</i> , 2010; Wongkit & Mckercher, 2016; Henson <i>et al.</i> , 2015; Fetscherin & Stephano, 2016
14	1	Intermediaries	Crooks <i>et al.</i> , 2010; Connell, 2011; Henson <i>et al.</i> , 2015; Lunt <i>et al.</i> , 2015; Wongkit & Mckercher, 2016
15	1	Opportunity to take a vacation	Connell, 2006; Henson <i>et al.</i> , 2015; Zehrer <i>et al.</i> , 2016; Aydın & Karamehmet, 2017
16	0.538	Prices of touristic products	Connell, 2011; Sultana <i>et al.</i> , 2014; Fetscherin & Stephano, 2016; Zehrer <i>et al.</i> , 2017
17	0.538	Hospitality	Dwyer & Kim, 2003; Zhou <i>et al.</i> , 2015; Aydın & Karamehmet, 2017; Zehrer <i>et al.</i> , 2017
18	0.538	Cultural and natural attractions	Gomezelj & Mihalič, 2007; Connell, 2011; Zhou <i>et al.</i> , 2015; Henson <i>et al.</i> , 2015; Perna <i>et al.</i> , 2018
19	0.538	Food and beverage facilities	Connell, 2011; Lunt <i>et al.</i> , 2015; Zhou <i>et al.</i> , 2015; Fetscherin & Stephano, 2016
20	0.692	Accommodation companies	Connell, 2006; Lunt <i>et al.</i> , 2015; Henson <i>et al.</i> , 2015; Heung <i>et al.</i> , 2010; Fetscherin & Stephano, 2016
21	0.692	Treatment and tour packages	Connell, 2006; Henson <i>et al.</i> , 2015; Das & Mukherjee, 2016; Fetscherin & Stephano, 2016
22	0.538	Government policy	Dwyer & Kim, 2003; Enright & Newton, 2005; Crouch, 2011; Lunt <i>et al.</i> , 2015; Aydın & Karamehmet, 2017
23	1	Bilateral agreements between countries	Hopkins <i>et al.</i> , 2010; Connell, 2011; Lunt <i>et al.</i> , 2015; Cohen, 2015
24	0.538	Compliance with medical ethics	Bookman & Bookman, 2007; Kotler <i>et al.</i> , 2008; Lunt & Carrera, 2010; Lunt <i>et al.</i> , 2015; Cohen, 2015
25	1	Promotional activities	Kotler <i>et al.</i> , 2008; Crooks <i>et al.</i> , 2010; Heung <i>et al.</i> , 2010
26	0.692	Use of information technologies	Kotler <i>et al.</i> , 2008; Crooks <i>et al.</i> , 2010; Henson <i>et al.</i> , 2015; Ganguli & Ebrahim, 2017; Roy <i>et al.</i> , 2018
27	0.692	Effectiveness of national / local tourism organizations	Dwyer & Kim, 2003; Heung <i>et al.</i> , 2010; Zehrer <i>et al.</i> , 2017; Perna <i>et al.</i> , 2018
28	0.692	Vision of the destination	Ritchie & Crouch, 2003; Lunt <i>et al.</i> , 2015; Zehrer <i>et al.</i> , 2017; Roy <i>et al.</i> , 2018
29	0.538	Analysis of competitor destinations	Enright & Newton, 2005; Zehrer <i>et al.</i> , 2017; Perna <i>et al.</i> , 2018

Source: Authors

Yeşilyurt & Çapraz, 2018). Of these, several items were excluded because they were represented in other variables or were not rated as priority statements by the majority of the experts. Thus, the final data set included the 29 expressions listed in Table 4.

Table 4 consists of the determinants of destination competitiveness in MT that were obtained by reviewing the most remarkable medical tourism studies in the literature, and then presented to the evaluation of MT experts throughout Türkiye. Due to the knowledge and experience of these expert in international healthcare destinations it has been ensured that these factors consist of a set of determinants that can be used in determining the competitiveness of any MT destination. In this study,

these determinants were used to form the hierarchical structure, as explained below.

#### *Analytic hierarchy process results*

As previously explained, to make pairwise comparisons between factors listed in Table 4, factors close in terms of common features were gathered, before a factor definition was made for each group. Figure 5 shows the resulting hierarchical structure in which the second and third levels emerged by forming its purpose, factor headings, and sub-factors.

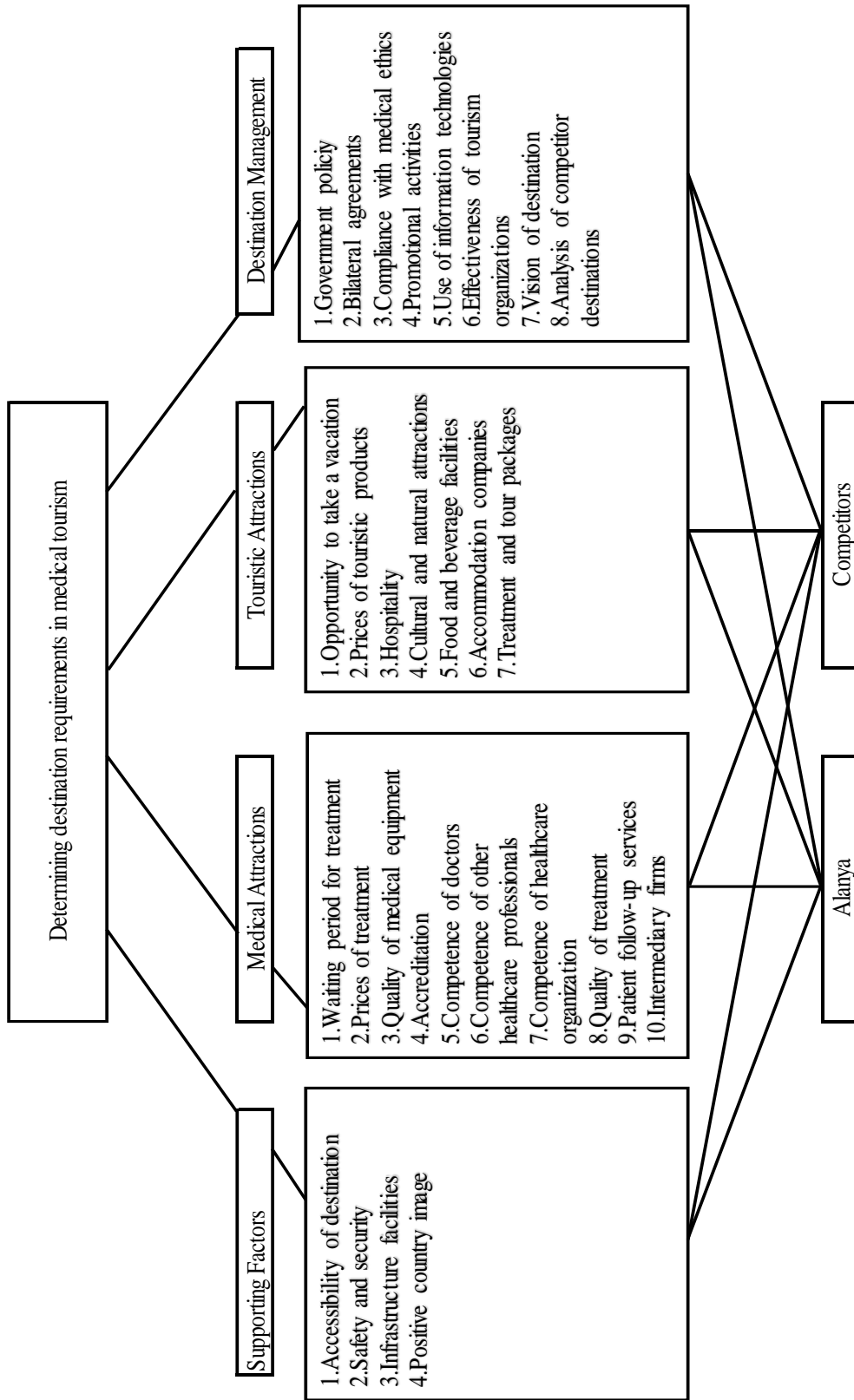


Figure 5. Hierarchical Structure for Determining Destination Requirements in MT

Source: Authors



Figure 5 also includes a fourth level with two alternatives: Alanya and competitors. The aim here was not to choose the most competitive destination but to determine Alanya’s position relative to its competitors. These were destinations in similar markets considered preferable in their treatments, and with similar touristic attractions.

The questionnaire, consisting pairwise comparisons and some statistical information from the hierarchical structure, was administered to MT stakeholders in Alanya between May 2019-August 2020.

**Participants’ evaluations of medical tourists’ preferences for Alanya**

The questionnaire also asked the MT experts for information about medical tourists who prefer Alanya that was unavailable on governmental or non-governmental databases. AHP aims to have the determinants of MT destination requirements evaluated by subject experts (Crouch & Ritchie, 2005). Here, the experts were selected by two main criteria: holding mid-level or senior managerial positions as MT stakeholders, and/or having sufficient MT knowledge and experience They included TURSAF, ALSTUD, and SATUMER board members, and doctors, academicians, hotel, hospital and intermediary firm managers, and local managers (Table 5).

**Table 5. Information on Experts**

N	Profession	Experience (years)
1	Academician	15
2	Manager of intermediary firm	8
3	Doctor	21
4	Hotel manager	30
5	Academician	15
6	Dentist	12
7	Manager of intermediary firm	22
8	Manager of healthcare organization	15
9	Academician	5
10	Dentist	28
11	Doctor	26
12	Dentist	35
13	Manager of intermediary firm	28
14	Academician	27

Source: Authors

According to the experts (see Table 6), the most frequent reasons for patients’ choosing an MT destination were that their treatments were not covered by health insurance in their home country and knowledge of the experiences of other previously treated patients. The experts also offered that Alanya’s most popular services were aesthetic and dental. Regarding nationalities, patients most frequently came from the Russian Federation and Scandinavia. However, patients from Iran, Arab countries, and Turkic republics (included under “Others” in Table 6), were now replacing patients from countries like Germany and the UK, which previously provided most medical tourists.

**Table 6. Experts’ Evaluations of Patients’ Preferences**

Reason for treatment abroad	Frequency	Percentage
*Treatments not covered by insurance	9	64.3
Treatments not available in own country	5	35.7
Need for confidentiality and privacy	0	0
Total	14	100
<b>Reason for choosing Alanya</b>		
Recommendations of family and friends	4	28.6
*Patient experiences with previous treatment	7	50.0
Recommendations of intermediaries	1	7.1
Recommendations of doctors	0	0
Own healthcare experiences	2	14.3
Total	14	100
<b>Main countries sending patients to Alanya</b>		
Russia Federation	5	35.7
Scandinavian countries	4	28.6
Others	5	35.7
Total	14	100
<b>The most preferred treatment type</b>		
Dental treatments	11	78.5
Aesthetic treatments	3	21.5
Total	14	100

Source: Authors

**Relative importance weights of determinants**

For the pairwise comparisons, the experts were first asked to compare the factors against each other. Then, they compared the sub-factors of each factor in order of importance.

**Table 7. General Inconsistency Rates of the Factors**

Key Factors	CR
Supporting Factors	0.062
Medical Attractions	0.014
Touristic Attractions	0.01
Destination Management	0.01

N=14/ TO≤0.1

Source: Authors

The experts’ opinions regarding the total value of the sub-factors were highly consistent (Table 7), given that a consistency ratio of 0.10 or less is considered acceptable (Saaty, 1990).

In the last stage of the pairwise comparisons, the MT experts were asked to evaluate Alanya’s performance. To do so, they first named a competitor destination, with 11 experts choosing Istanbul and three choosing Antalya. They then identified the factors making Alanya successful or unsuccessful against these competitors.

Two different factor weights are formed in AHP. First, bilateral comparison of the participants is used to form local importance and performance weights (Saaty, 1987, pp. 165). Then, global importance and performance weights are calculated by multiplying each sub-factor’s local weights by the relevant main factor weight (Erbaş & Perçin, 2016, pp. 83). The global importance weight represents each sub-factor’s importance and performance

level within the whole structure. Hence, global importance and the sub-factors' performance values were used in this study.

**Table 8. Importance and Performance Weights of Sub-Factors**

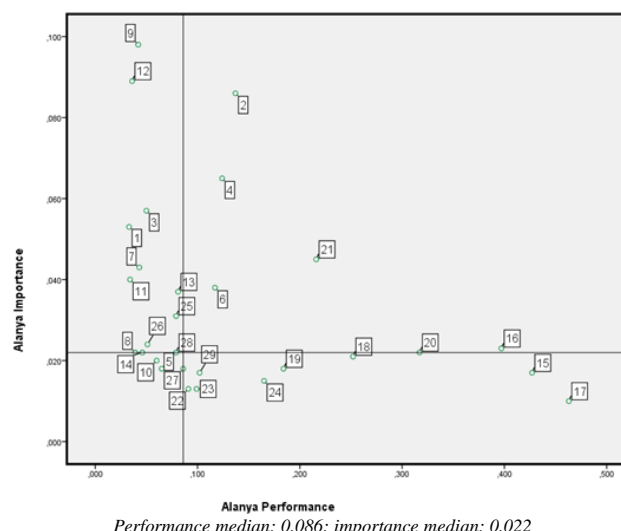
N	Key Factors/Sub-Factors	Global Importance Weights	Global Performance Weights
<b>Supporting Factors</b>			
1	Accessibility of destination	0.053	0.033
2	Safety and security	0.086	0.137
3	Infrastructure facilities	0.057	0.050
4	Positive country image	0.065	0.124
<b>Medical Attractions</b>			
5	Waiting period for treatment	0.018	0.065
6	Prices of treatment	0.038	0.117
7	Quality of medical equipment	0.043	0.043
8	Accreditation of healthcare providers	0.022	0.039
9	Competence of doctors	0.098	0.042
10	Competence of other healthcare professionals	0.020	0.060
11	Competence of healthcare providers	0.040	0.034
12	Quality of treatment	0.089	0.036
13	Patient follow-up services	0.037	0.081
14	Intermediary firms	0.022	0.046
<b>*Touristic Attractions</b>			
15	Opportunity to take a vacation	0.017	0.427
16	Prices of touristic products	0.023	0.397
17	Hospitality	0.010	0.463
18	Cultural and natural attractions	0.021	0.252
19	Food and beverage facilities	0.018	0.184
20	Accommodation companies	0.022	0.317
21	Treatment and tour packages	0.045	0.216
<b>Destination Management</b>			
22	Government policy	0.013	0.091
23	Bilateral agreements between countries	0.013	0.099
24	Compliance with medical ethics	0.015	0.165
25	Promotional activities	0.031	0.079
26	Use of information technologies	0.024	0.051
27	The effectiveness of national/local tourism organizations	0.018	0.086
28	Vision of destination	0.022	0.079
29	Analysis of competitor destinations	0.017	0.102

Source: Authors

As Table 8 shows, the experts considered sub-factors under medical attractions and supporting factors as most important for tourists when choosing an MT destination. However, they also evaluated Alanya's performance as lagging behind its competitors in these factors. Conversely, although their importance weights are low, they evaluated Alanya as more successful than its competitors in touristic attractions and destination management.

**Importance performance analysis results**

Figure 5 presents the importance and performance scores objectively as an importance-performance matrix, created using the AHP scores for all 29 sub-factors. The matrices were created using SPSS 20 with the crossing point was defined as the median, following Martilla and James (1977, pp. 79).



**Figure 6. Positioning of Expert Evaluations in the IPA Matrix**

Source: Authors

Table 11 shows which areas Alanya should concentrate on based on the IPA matrix; that is, sub-factors with both high importance and low performance scores. In addition, accreditation (8), intermediaries (14), and destination vision (28) fell between concentrate here and low-priority areas in the matrix, so they were also included as needing further attention.

**Table 9. Destination Requirements**

N	Factor	Factor Number	Importance Weight	Performance Weight
1	Accessibility of destination	1	0.053	0.033
2	Infrastructure facilities	3	0.050	0.050
3	Quality of medical equipment	7	0.043	0.043
4	Accreditation of healthcare providers	8	0.022	0.039
5	Competence of doctors	9	0.098	0.042
6	Competence of healthcare providers	11	0.040	0.034
7	Quality of treatment	12	0.089	0.036
8	Patient follow-up services	13	0.037	0.081
9	Intermediaries	14	0.022	0.046
10	Promotional activities	25	0.031	0.079
11	Information technologies	26	0.024	0.051
12	Destination vision	28	0.022	0.079

Source: Authors

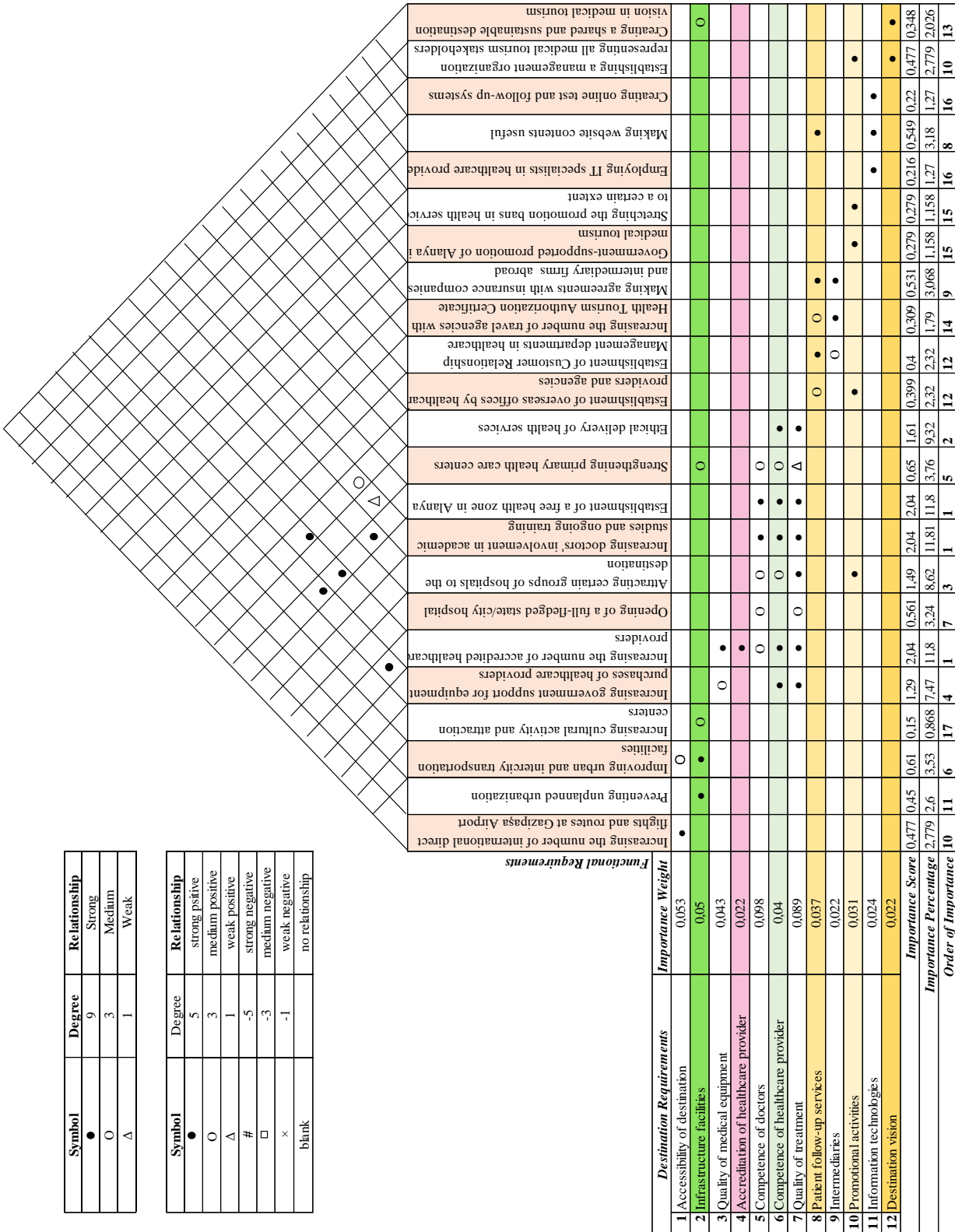


Figure 7. HOQ for Destination Competitiveness

Source: Authors

**House of quality**

To build the HOQ, the competitiveness factors to be included in the questionnaire were identified with CV, and their importance and performance values for Alanya were calculated with AHP. Then, after identifying the destination requirements using IPA, strategies were developed through in-depth interviews with the same experts for each requirement to make Alanya more competitive as an MT destination (Table 5). These suggestions, seen as functional requirements in the HOQ, were simplified for inclusion in the matrix to obtain 23 functional requirements (Figure 7).

The construction relationships between the destination and functional requirements were then evaluated and presented in the matrixes formed in the HOQ (Figure 7). These were based on the evaluations of eight of the 13 MT experts previously interviewed.

For the matrix evaluation, first the degree to which the functional requirements meet each destination requirement was determined to demonstrate how effective the functional requirements are in ensuring Alanya’s MT destination competitiveness. Accordingly, a functional requirement developed to strengthen competitiveness that strongly affects achieving the destination requirements scored 9 in the matrix, 3 for a moderate effect, and 1 for a weak effect. If there was no relationship, then the relevant part of the matrix was left blank (Govers, 1996, pp. 580; Das & Mukherjee, 2008, pp. 338). Because the values given by the experts to each relationship differed, the most frequently repeated value (modal value) was added to the matrix for making the weight calculations (Das & Mukherjee, 2008, pp. 338). This matrix appears in the center of the HOQ. While calculating the functional requirements’ importance values, the relationship values given by the experts to each functional requirement were multiplied by the importance values of the destination requirements corresponding to the lines in which they were included to obtain their cumulative value and the absolute functional importance values (Govers, 1996; Chan & Wu, 2005; Das & Mukherjee, 2008).

The Order of Importance section at the bottom of the matrix displays the importance scores for each of these strategies. As can be seen, the most important strategies were determined by selecting the five most important statements in order of importance. The resulting matrix (Figure 7) indicates that the most important functional requirements that might improve Alanya’s MT competitiveness are increasing government support for medical equipment purchases, establishing more accredited healthcare providers, attracting specific hospital groups to the destination, increasing doctors’ involvement in academic studies and ongoing training, establishing a healthcare free zone, strengthening primary healthcare services, and ethical delivery of health services. The first priority in the ranking was given to three separate strategies because they all received the

same importance score. As a result, Table 10 lists the seven most important functional requirements in total based on the HOQ weights.

**Table 10. Functional Requirements**

N	Suggestion	Weight	Ranking
5	Increasing government support for medical equipment purchases	1.29	4
6	Establishing more accredited healthcare providers	2.04	1
8	Attracting specific hospital groups to the destination	1.49	3
9	Increasing doctors’ involvement in academic studies and ongoing training	2.04	1
10	Establishing a healthcare free zone	2.04	1
11	Strengthening primary healthcare services	0.65	5
12	Ethical delivery of health services	1.61	2

Source: Authors

The training of doctors, accredited medical services, and health-free zone are given the highest importance among the suggested strategies, as shown in Table 10. Table 11 shows how these most important functional requirements affect each other. This relationship is located on the HOQ roof (Figure 7).

The purpose of calculating this roof matrix is to determine the relationship between the functional requirements and whether implementing one positively or negatively affects the implementing of another. Table 11 indicates no negative relationships between these requirements, so all of these relationships can be included in determining and implementing the recommended investments. For example, if Alanya establishes a healthcare free zone, it is anticipated that healthcare providers there would receive more government support for equipment purchases and specific hospital groups would be attracted to Alanya. The hospitals and clinics established in the free zone would also be more willing to obtain accreditation certificates to attract international medical tourists, thereby increasing the number of accredited healthcare providers in Alanya.

Similarly, expanding the number of accredited healthcare providers will increase the ethical delivery of health services and government support in purchasing medical equipment for healthcare providers. Increasing doctors’ involvement in academic studies and ongoing training in their fields, which is crucial for increasing doctors’ competencies and therefore treatment quality, will also ensure ethical health service delivery. Furthermore, primary healthcare services should be strengthened to decrease the burden of local patients on Alanya’s hospitals, thereby giving doctors more time for academic research and training. In short, the three key functional requirements for strengthening Alanya’s MT destination competitiveness are expanding the number of accredited healthcare providers, increasing doctors’ involvement in academic studies and ongoing training to improve their competencies, and establishing a healthcare free zone. Moreover, by prioritizing investments in these areas,

**Table 11. Relationship of Functional Requirements**

Functional Requirements	Relationship	Functional Requirements
Establishing more accredited healthcare providers	Strong Positive	Ethical delivery of health services
	Strong Positive	Increasing government support for medical equipment purchases
Establishing a healthcare free zone	Strong Positive	Increasing government support for medical equipment purchases
	Strong Positive	Attracting specific hospital groups to the destination
Increasing doctors' involvement in academic studies and ongoing training	Strong Positive	Establishing more accredited healthcare providers
	Strong Positive	Ethical delivery of health services
	Medium Positive	
	Weak Positive	Strengthening primary healthcare services

Source: Authors

Alanya will be able to meet the other destination requirements.

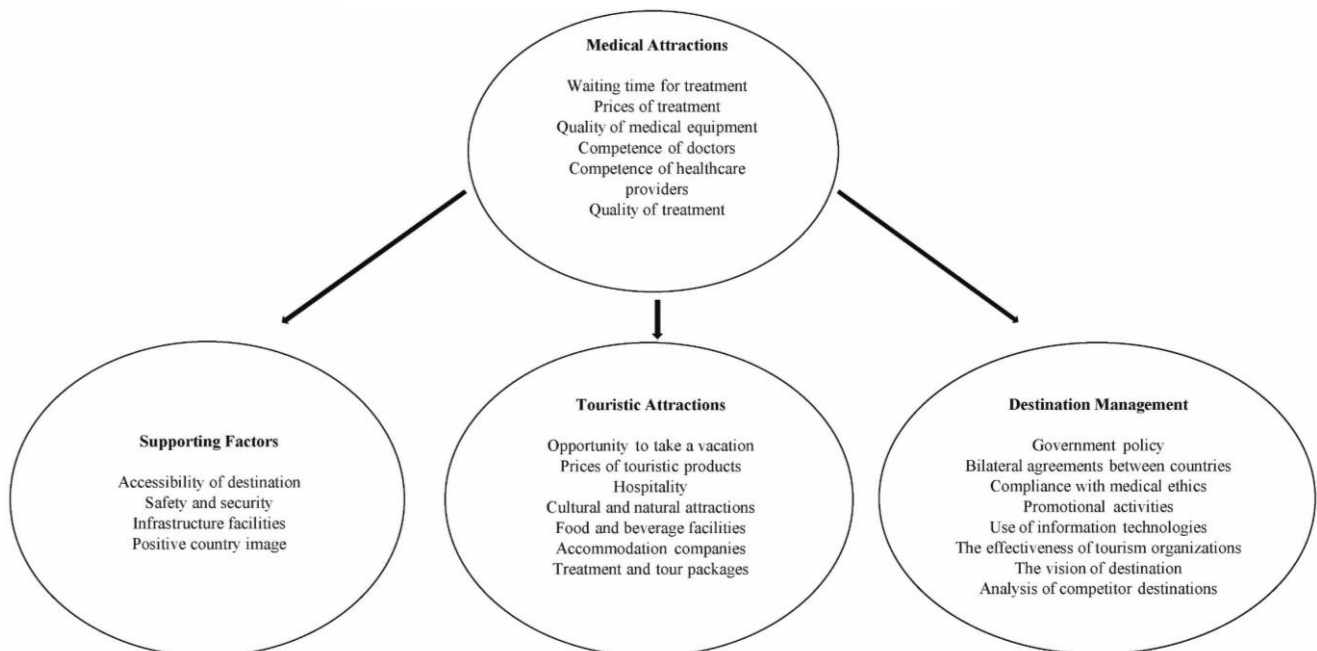
**5. Conclusion**

This study, which focusing on the current situation of the city of Alanya in Türkiye in terms of medical tourism and determining the strategies that will enable its development, is important in terms of the direct contributions of the destination to the MT industry. In addition, the current study, as in the study of Heung et al. (2010), deals with the needs and expectations of medical tourists from the perspective of supply on MT institutions related to the infrastructure and superstructure development and promotion activities of the destination. The literature review revealed that there is no agreed set of determinants that can be used to assess a destination's MT competitiveness. For this reason, firstly, the models developed by previous studies were examined and suggested determinants for MT competitiveness were

presented. After that, expert suppliers with international experience in MT were consulted so that these determinants could be used to measure the competitiveness of any destination. The aim was to downsize and evaluate the determinants by MT specialist suppliers. Then, a significant contribution was made to the field with the new set of determinants obtained by ranking the MT determinants with the CV application. Below, Figure 8 presents the key components from the study's findings and the determinants gathered under these components for MT competitiveness in a destination.

It should be noted in Figure 8 that the components of medical attractions, supporting factors, tourist attractions and destination management that make up MT competitiveness are interdependent. In addition, the importance of each determinant may vary depending on the treatment needed by the medical tourist and the main characteristics and opportunities of the destination

**MEDICAL TOURISM COMPETITIVENESS**



**Figure 8. Determinants Of Medical Tourism Destination Competitiveness**

Source: Authors



(Cormany, 2010; Heung et al., 2010). Therefore, Alanya's medical tourist type and destination requirements were first determined using AHP and IPA. Then the HOQ was designed, which is the main output of the QFD studies. This matrix offered a framework for identifying destination requirements and how they are supposed to be fulfilled through objective evaluations. The HOQ reveals the destination's ability to meet the expectations of medical tourists and proposes strategies to increase the success of Alanya in the areas it lags behind. Thus, the current study details the use of AHP-QFD along with CV and IPA applications to strengthen the competitiveness of an MT destination.

In the research, mostly minor surgical procedures such as dental or aesthetic operations take the first place in the preference of tourists for Alanya as an MT destination. Meanwhile, according to expert opinions, it is important for destinations to perform well as a tourist attraction. As a matter of fact, in their study, Ganguli and Ebrahim (2017) state that in order for a destination to carry out effective MT management, the services provided by the health and tourism sectors should be strategically addressed together. Cormany (2010) states that when medical tourists want to combine treatment with vacation, the joint and harmonious work of the health and tourism sectors will create added value. In this respect, the fact that Alanya is preferred for minor and non-urgent operations and is a destination with touristic attractions is one of the most important indicators of being a competitive MT destination.

According to interviews with experts, medical tourists are mostly influenced by the personal experiences that previous patients have told them. This finding shows that destination selection in MT is mostly based on non-public and unofficial information such as forums, discussion and rating websites and other electronic media, clinics' information sharing and promotional websites or social media platform accounts, and friend and acquaintance recommendations. It is also supported by previous research, which reveals that it is based on these kinds of sources (Hanefeld et al., 2015; Connel, 2016). Therefore, MT destinations and suppliers should base their promotion strategies on the quality of treatment and patient satisfaction. As stated in the studies in the literature (Smith & Forgione, 2007; Heung et al., 2010; Fetscherin & Stephano, 2016; Wongkit & Mckercher, 2016), patient preferences in a medical tourism destination are mostly shaped by the quality of the medical services and facilities offered by the destination. As a matter of fact, the quality of medical services comes to the fore in the preference of Alanya as a medical tourism destination, regardless of the type of treatment. In addition, according to the HOQ matrix for Alanya, the most important strategies to strengthen competitiveness resulted in the necessity of increasing the competence of doctors and other healthcare providers.

Despite the relatively low order of importance in the HOQ matrix, expert supplier interviews highlight the importance of the vision for a strong MT destination. Developing closer relations between national and local tourism organizations and having a consensus MT vision that includes all stakeholders will make that destination competitive. On the other hand, as Ulaş and Anadol (2016) stated, cooperation and coordination between stakeholders is very important for continuous development in MT destinations. A destination that experiences failure or weakness in terms of any MT competitiveness determinant will increase the probability that other determinants will fail as well. Therefore, destination management with a high level of initiative will also ensure that the strategies proposed here are included in government policies to increase MT destination competitiveness, which is crucial for all developing countries.

As a result, important theoretical and practitioner-oriented inferences can be made from the findings obtained and presented in this study. As mentioned earlier, the components and determinants of MT competitiveness seen in Figure 8 will apply to all MT destinations that want to increase their competitiveness and aim for higher market share. This proposed set of components and determinants will provide a theoretical and methodological framework for researchers aiming to determine the MT competitiveness of a destination in future studies. The findings also provide a highly functional perspective and a roadmap for the management of other MT destinations, especially in developing countries. The study also shows that AHP, IPA, and QFD are a very useful and efficient set of methods for determining the competitive characteristics of an MT destination and strategies to meet them. In other words, the study provides practical insights and operational and competitive strategies for all MT stakeholders, including policy makers, healthcare providers, non-governmental organizations (NGO's) and tourism professionals.

#### *Limitations and directions for future research*

The study successfully reveals the main determinants of MT competitiveness in Alanya. In addition, competitive strategies have been proposed for the stakeholders of the Alanya MT industry supply side. The research has some limitations. The most important limitation encountered is the extreme difficulty of reaching health and tourism professionals and conducting long interviews, which are crucial for evaluating MT competitiveness determinants. For this reason, the number of experts whose opinions can be consulted is very small. In addition, as it is known, this study focuses on the supply side of the MT industry and deals with the competitiveness of MT destinations in terms of the stakeholders who produce and provide this service. Future studies should be designed to include views of the MT current and potential demand side. In this way, current and potential medical tourists will be



able to guide the development of competitive strategies by taking their evaluations of the determinants necessary for the competitiveness of an MT destination. Destinations that want to adapt to the customer-oriented approach of modern marketing should consider the determinants of MT competitiveness in terms of supply and demand-side stakeholders.

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## INFO PAGE

**Determining destination competitiveness in medical tourism: A study based on AHP-QFD framework****Abstract**

This study investigates the competitiveness of Alanya, a medical tourism destination in Turkey, and determines appropriate strategies using the analytical hierarchy process and quality function deployment. Data were collected from medical tourism experts to gain managerial insights into the factors affecting the competitiveness of medical tourism. The findings show that medical tourists primarily focus on medical factors such as competence of doctor and quality of treatment. The main strategies to strengthen competitiveness are to create a healthcare-free zone, to increase the number of accredited health care providers, and to encourage the involvement of doctors in academic research and ongoing training. For researchers interested in assessing competitiveness in medical tourism destinations, the study presents general determinants that should be considered in each destination. In addition, the findings show that each medical tourism destination should focus on its own determinants of medical tourism competitiveness when developing its marketing strategies. Finally, it shows that the analytical hierarchy process and quality function deployment approaches can be successfully applied in achieving destination competitiveness and strategic planning, with content validity and importance performance analysis.

**Keywords:** Destination competitiveness, Medical tourism (MT), Analytic hierarchy process (AHP), Quality function deployment (QFD), House of quality (HOQ), Alanya.

**Authors**

Full Name	Author contribution roles	Contribution rate
<b>Vildan Yılmaz:</b>	Conceptualism, Methodology, Software, Validation, Formal Analysis, Investigation, Data Curation, Writing - Original Draft, Writing - Review & Editing, Visualization, Supervision	60%
<b>Ebru Güneren:</b>	Conceptualism, Methodology, Validation, Writing - Review & Editing, Visualization, Supervision	40%

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