International Journal of Tourism, Culture and Spirituality, 2024, 7(2) https://www.ijtcs.usc.ac.ir

Print ISSN: 2588-6134 Online ISSN: 2783-3844

International journal of
Tourism, Culture and Spirituality

http://doi.org/10.22133/ijtcs.2025.488397.1191

Identifying and ranking the Competitive Advantages of Hospital Hotels in Islamic Countries using the DEMATEL Method (An Iranian Case Study)

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Article Info

Received:
2024-10-17
Accepted:
2024-12-20

Keywords:
Hospital Hotels
Competitive Advantages
DEMATEL Method
Islamic Countries
Healthcare Services

Abstract

This study aims to identify and rank the competitive advantages of hospital hotels in Islamic countries, with a focus on an Iranian case study. Given the unique needs and cultural context of Islamic nations, the research investigates the key factors that contribute to the success of hospital hotels, including elements such as treatment measures, family hospitality, halal nutrition, and worship arrangements. The primary methodology used is the DEMATEL (Decision-Making Trial and Evaluation Laboratory) method, which is a pairwise comparison-based decision-making tool that effectively identifies relationships and hierarchies among system elements. Expert judgment from hospital hotel managers, employees, and Ministry of Health officials was employed to construct a Direct Influence Matrix, which was then normalized to assess both direct and indirect influences among the identified criteria. The results reveal that "Treatment Measures" and "Family Hospitality" are the most influential factors, acting as key drivers in enhancing overall service quality. Conversely, "Halal Financing" and "Worship Arrangements" were found to be the most dependent factors, influenced by the other elements in the system. Additionally, criteria such as "Patient Relationships" and "Halal Nutrition" exhibited high levels of prominence, indicating their central role in the competitive advantage of hospital hotels. The study concludes that focusing on improving core criteria like treatment measures and family hospitality will enhance the competitive position of hospital hotels in Islamic countries. These findings provide actionable insights for hospital hotel management and policymakers seeking to enhance service quality and cultural alignment in healthcare settings.

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How to cite:
Arefi, A., Fathi, M. R., & Ziadoust, M. M. (2024). Identifying and ranking the Competitive Advantages of Hospital Hotels in Islamic Countries using the DEMATEL Method (An Iranian Case Study). *International Journal of Tourism, Culture and Spirituality*, *7*(2), 17-39.

Introduction

Tourism is considered one of the most crucial industries in today's world. As a result of its increasing importance, it has become an income-generating industry with many capabilities and yielded positive economic outcomes. Many countries consider this industry one of the critical factors in generating income, creating jobs, reducing unemployment rates, fostering the growth of the private sector, and developing infrastructure. Therefore, more than any other economic and industrial activity in the world, it facilitates the transfer of capital and money and is the world's largest service industry by income (Zaroki & Owliaaynasab, 2018). Health tourism, due to its competitive advantages, has garnered significant attention and is experiencing rapid growth. This form of tourism refers to individuals traveling to other countries for healthcare and medical services. The increasing demand for high-quality medical services at lower costs compared to their home countries has contributed to the flourishing of this industry (Sereda et al., 2024). Today, there is an increasing competition among countries to attract medical tourists. In the marketing literature, differentiation is achieved through branding; each brand targets a specific group of tourists and may not be chosen by other groups of tourists (Arefi et al., 2020). The competitive advantage of hospital hotels, particularly in Islamic countries, is increasingly critical in the context of a rapidly evolving healthcare and hospitality landscape. As the demand for integrated healthcare services rises, hospital hotels must differentiate themselves to attract patients and their families seeking comfort and convenience during medical treatments (Khan et al., 2024). However, many hospital hotels struggle to establish a unique value proposition that effectively addresses the specific needs of their clientele, which often includes cultural and religious considerations unique to Islamic contexts (Hammad & Abd El Maksoud, 2024). Despite the growing recognition of the importance of competitive advantages in the hospitality sector, there remains a lack of empirical research focused on hospital hotels, particularly regarding how they can leverage their unique attributes to enhance patient satisfaction and loyalty (Alam et al., 2023). The integration of Islamic hospitality principles, which emphasize ethical service delivery and adherence to halal standards, presents both opportunities and challenges for these establishments (Nasir et al., 2022).Most patients seek treatment in reputable and leading medical centers in advanced countries or the capitals of countries with well-equipped healthcare facilities (Morovati & Asadian, 2014). Governments are increasingly recognizing the economic benefits of health tourism, fueled by globalization that allows patients to access diverse healthcare services internationally Competition among developing countries in Asia is key to attracting medical tourists seeking quality care at competitive prices. Countries are enhancing healthcare infrastructure and marketing their services to position themselves as attractive destinations, which benefits healthcare providers and contributes to local economic development through revenue generation and job creation (Zhong et al., 2024). There is an increasing number of countries attempting

to enter the health tourism industry to improve their position as a "health tourism destination" due to the attractive market for health tourism. For example, the Middle East has strived to become a top destination for health tourism to attract international patients. Therefore, competition in this industry is fierce and sensitive, and countries should seek to gain a competitive advantage.

It is noteworthy that, in the past, hospitals were deliberately constructed for medical and surgical purposes; however, today, we can observe a double humanism in the construction and management of hospitals. Hospitals of this type rely not solely on healthcare hardware to satisfy customers but also on accommodation spaces, private rooms, effective patient communication, and medical staff. Consequently, the globalization of health tourism has led entrepreneurs to develop innovative ideas to minimize tourists' problems before, during, and after treatment, thus contributing to health tourism's prosperity. In a medical hotel, regular hotel services are combined with healthcare services. Medical hotels provide high-quality care, quick access to medically necessary procedures (e.g., minimal waiting lists), cost savings, and modern medical equipment and technology. As a result, medical tourists' potential concerns will be reduced, increasing their arrivals. Iran has a long history of health tourism. Historically, people from different countries traveled long distances to receive medical treatment using mineral waters or Iranian traditional medicine (Arabshahi & Arianfar, 2013). Identifying existing opportunities, the country's ability to capitalize on these opportunities, and, in short, gaining competitive advantages are essential and strategic measures in attaining such a position. A significant challenge Muslims face in the tourism industry, and specifically in health tourism, is that the cultural structures of many countries contradict Islamic law. Frequently, they face restrictions such as finding halal food, serving large quantities of alcohol, and mixing men and women (Torabi, 2012). On the other hand, due to the large number of Muslims and their high potential market, movements have been initiated to address these issues and utilize this market segment within the health tourism industry (Alserhan, 2010). Muslim countries such as Iran can take advantage of Muslims' increasing capacity as one of their unique opportunities. There are approximately one billion and 800 million Muslims in the world. Muslims are increasing daily; by 2025, they will make up one-third of the global population (Shir Khodaee & Nooripour, 2014). According to research, Islamic countries' tourism is experiencing a significant growth trend to achieve an acceptable profit through the provision of tourism services explicitly targeted at Muslims (Alserhan, 2010). On one hand, consumers tend to remain loyal to brands that have a personality that aligns with their own. When a consumer perceives congruence between a brand and their own personality, they are less likely to switch to another product or organization (Arefi et al., 2023). resulting in the formation of a positive attitude towards the brandPatient and companion satisfaction has become an increasingly important aspect of health care today. Service providers are primarily responsible for meeting patients' actual and tangible needs and ensuring their satisfaction.

However, patients and their companions are unsatisfied simply by receiving professional services and utilizing advanced technologies. However, this satisfaction is also greatly influenced by the quality and variety of patient accommodation services and how employees behave and adapt to the patient's culture. Patients may re-select the hospital in the future if these services are provided alongside professional services. Therefore, hospital hotels are one of the places that can create the maximum satisfaction for medical tourists. Due to the increasing trend of attracting medical tourists to Asian countries, Iran's potential for health tourism (as an Islamic country), and the importance of competitive advantage for medical center management, the present study utilizes the DEMATEL technique to identify and prioritize the factors contributing to the competitive advantage of hospital hotels in Islamic countries.

Literature Review

Health Tourism and Hospital Hotel

In health tourism, health is the primary demand product, generating demand for tourism-related elements (such as transportation, accommodations, etc.). As a result, its growth means creating simultaneous demand in both the health and tourism sectors (Shalbafian, 2015). According to the World Tourism Organization (UN Tourism), any definition of "health tourism" should encompass three dimensions: time, place, and purpose of travel. The World Health Organization (WHO) defines health as complete physical, mental, and social well-being rather than merely the absence of disease or disability. Consequently, health tourism refers to traveling outside of one's local environment for a maximum of one year to maintain, improve, or recover physical and mental well-being (Klímová & Kuča2 2222.

There are three types of health tourism:

1. **Medical Tourism**: This involves traveling to a hospital or medical center to receive treatment for a physical illness or to undergo surgery under the supervision of qualified medical professionals. This type of tourism is often sought by individuals looking for specialized medical care that may not be available in their home country or at a more affordable cost .
2. **Curative (Therapeutic) Tourism**: This type focuses on treating specific diseases through recovery periods that utilize natural healing resources. These resources may include mineral and hot springs, salt lakes, and various forms of therapy such as mud, water, and air therapy, all under the supervision of healthcare professionals.
3. **Preventive (Wellness) Tourism**: In this category, tourists travel to wellness centers, spas, or healthy villages to rejuvenate and relieve stress from daily life without the need for medical intervention. This type of tourism is aimed at individuals who do not have any physical ailments but seek to enhance their overall well-being (Koryagina et al., 2024).

Among the five types of "medical-wellness tourism" businesses identified by Voigt and Laing (2013), three categories can be distinguished:

- Only wellness tourism service providers: beauty spa resorts/hotels, lifestyle resorts/retreats, and spiritual retreats
- Only medical tourism service providers: private clinics, private hospitals
- The intersection of medical and wellness tourism service providers: lifestyle treatment retreats, wellness hospitals, wellness centers, hospital hotels, and medical spas (Shalbafian, 2015).

Hospital hotels see the hospitality industry's involvement in medical wellness. Simply put, a hospital hotel collaborates with a hotel and a private biomedical clinic to attract medical tourists. Hospital hotels do not target chronic diseases but rather temporary physical complications such as burns, sports injuries, and back pain (Ibid). In contrast to lifestyle resorts, these centers do not offer a comprehensive lifestyle program to their guests. While they may provide beauty, fitness, and spa services, they typically focus on advanced diagnostic and biomedical services.

Hospital hotels provide a wide range of hotel services and products. These facilities provide extra convenience for their patients by offering affordable medical and treatment services, clean and comfortable rooms and suites, meals appropriate to their culture and values, and well-equipped restaurants. Travelers can communicate quickly and effectively with the host country at these locations with the assistance of bilingual translators and medical coordinators. Finally, people will feel more secure upon returning home due to the availability of healthcare professionals and reliable services during and after treatment, especially for clients who require a full recovery.

Islamic Medical Tourism

The significance of health tourism is increasing, particularly within Islamic principles. Islamic health tourism involves medical travel that complies with Shariah law, addressing both physical health needs and the spiritual and ethical aspects of care. Its growth is driven by rising demand for Islamic-compliant medical services, the emergence of Muslim-friendly healthcare facilities, and greater awareness among Muslim travelers about their health options. This trend emphasizes the importance of integrating religious values into healthcare experiences to ensure patient comfort and respect (Ispirli Turan & Erdem, 2021).

Thus, there is a relationship between religion and tourism, including religion and travel abroad for medical and health reasons, i.e., the entire supply chain of medical tourism must comply with Sharia law. As a result, marketing and promotional strategies should be aligned with Sharia standards so that Muslim tourists are aware of Islamic tourism products and services (Medhekar & Haq, 2015). The following features have been identified as culturally sensitive to Muslim patients: provision of prayer

and supplication facilities, halal food, halal medicine upon patient request, gender-sensitive hospital care, conventional clothing, halal cafe in the hospital, family waiting rooms, gender-specific waiting rooms, consideration of fasting and Ramadan, facilities for bathing and ablution, avoiding abortions unless necessary, providing financial resources from Islamic and Halal banks and institutions, and refraining from displaying offensive and obscene images (Medhekar & Haq, 2015). Based on Islamic verses and traditions, an Islamic hospital has three characteristics: (1) a hospital's location and setting (including greenery and sunlight, clean air, plenty of water, soft soil and ground, etc.); (2) the characteristics of the hospital's departments (such as the orderliness of rooms and equipment, cleanliness of the environment and clothing, the absence of complicated bureaucracy, peace, convenient meeting times, etc.); and (3) hospital staff characteristics (i.e., a lack of wealth-seeking views regarding the medical profession, Muslim workforce, Islamic morals and practices, liberality, chastity, courage, knowledge, appropriate staff behavior, refraining from abandoning treatment due to unpaid wages, avoiding wasting medication, etc.) (Amali, 2008).

Medical Tourism's Competitive Advantage

Porter's theory of competitive advantage aligns better with the realities of the modern economy and international trade conditions. External and internal factors can create a competitive advantage. Internal factors that influence the success of an industry include market structure, technological intensity, and productivity. Government support is an external factor of competitive advantage. According to the strategic literature on competition, the most common definition of competitive advantage is creation, i.e., whatever increases revenue more than costs. In healthcare organizations, patients expect that doctors and medical professionals have two-way communication and active participation in treatment, they have easy access to nursing services, their treatment is completed promptly and correctly, they deal with knowledgeable, trustworthy, and courteous individuals, and they understand where and how services can be obtained. There is a direct correlation between healthcare policies and the market structure of service providers, which includes price, quantity, and quality. In recent years, the medical and hospital industries have experienced significant changes, and the competition has become fierce. Thus, competitive advantage has gained unique and distinct significance. Alam et al. (2023) elaborate on how the integration of Islamic hospitality practices can significantly influence the operational success of these establishments. While diverse foci and findings remain highly inconclusive, researchers seem to agree on the critical role of cultural and religious considerations in shaping the service delivery models of hospital hotels, partilll arly in regions where Islamic values are predominant (Boğan, ;;;;; Yusoff & Hassan, 2020). Hyshchuk (2023) emphasizes that the competitive advantages of hotel services are closely tied to their ability to meet consumer expectations, especially in environments affected by

cultural and religious norms (Othman et al., 2020). This is particularly relevant in Islamic countries, where adherence to halal standards and the provision of culturally sensitive services can enhance the appeal of hospital hotels to Muslim patients and their families (Jamaludin et al., 2023; Abd Razak et al., 2019). Furthermore, the application of decision-making frameworks, such as the DEMATEL method, provides a structured approach to identifying and ranking the competitive advantages of hospital hotels (Deri et al., 2023; Salem et al., 2021). This method allows for a comprehensive analysis of the interrelationships between various factors influencing competitive advantage, including service quality, operational efficiency, and customer satisfaction (Alamro et al., 2025; Prakash Pillai & Abraham, 2016). Despite the growing recognition of the importance of competitive advantages in the hospitality sector, there remains a lack of empirical research focused on hospital hotels, particularly regarding how they can leverage their unique attributes to enhance patient satisfaction and loyalty (Shahidul Islam, 2023; mamukuu & Sarıışık,)))))) The integration of Islamic hospitality principles, whihh emphasize ethical service delivery and adherence to halal standards, presents both opportunities and challenges for these establishments (Komene et al., 2023; Widiastuti et al., 2024). Pahlevanzadeh et al. (2024) investigated the perspectives of the academic community on war tourism camps in Iran, utilizing the Q method and clustering algorithms for categorization. Their findings identified three categories of views and five clusters, reflecting diverse perspectives on this subject. Torabi et al. (2024) employed structural analysis and scenario planning to propose four plausible scenarios for Iranian food tourism: the Golden Scenario, Limited Scenario, Neglected Scenario, and Chaotic Scenario. These scenarios were designed based on critical factors such as food festivals and international relations, highlighting the impact of varying conditions on the future of food tourism. Khosravi et al. (2023) conducted a study on the Kashan Rosewater Festival to explore the effects of nostalgia, experiential marketing, and experiential values on tourist satisfaction and behavior. Their findings revealed that nostalgia influences pull motivation, loyalty behavior, and future travel intentions, although pull motivation does not directly affect travel intentions. The following sections reference some articles that have utilized the DEMATEL method. Fathi et al. (2024) identified key indicators for evaluating sustainable food supply chain performance using fuzzy cognitive mapping and fuzzy DEMATEL. Among the 26 criteria analyzed, "income distribution," "sustainable investment," and "average annual training time of employees" emerged as the most influential factors. These findings emphasize the importance of economic equity, sustainability investment, and workforce development in improving supply chain performance. Soltani et al. (2015) investigated the causal relationships among dimensions and indicators of social capital using fuzzy DEMATEL. Based on input from 14 experts at the University of Tehran, the study revealed that cognitive and structural indicators are causative factors, while relational indicators are in the effect group. These findings highlight the interconnected nature of social capital's dimensions and their

influence within a network of interactions. Ebrahimi and Fathi (2017) developed a model for evaluating Human Capital (HC) performance by integrating fuzzy DEMATEL and fuzzy Similarity methods. After constructing and validating a framework for HC components using confirmatory factor analysis, fuzzy DEMATEL was employed to assess the relative importance of interrelated HC components. The fuzzy Similarity method was introduced to rank organizations based on these components. The model's feasibility was demonstrated by evaluating and ranking three Iranian companies in the electric power and energy sector, highlighting its practical application in HC performance assessment. Rajabpour et al. (2022) investigated factors influencing the implementation of green human resource management (GHRM) in petrochemical companies in Bushehr City. Using a hybrid approach combining fuzzy AHP and type-2 fuzzy DEMATEL, the study identified five key categories: recruitment and employment, training and development, performance appraisal, service compensation and reward, and green organizational culture management, alongside 20 sub-criteria. The findings highlighted training and development as the most critical factor for successful GHRM implementation. Additionally, the study provided prioritized green measures for industry managers to facilitate effective environmental sustainability practices. Fathi et al. (2022) explored the future of Iranian apitourism by identifying key factors and developing scenarios using critical uncertainty and DEMATEL techniques. The study highlighted two primary drivers: "apitourism information system and promotional activities" and "organizing ecological infrastructure." Four scenarios were developed: Golden Beehive, Expectancy, Anonymous Bee, and Black Beehive. Among these, the Black Beehive scenario was deemed most likely, representing an isolated and vulnerable system, while the Golden Beehive scenario depicted the best-case scenario with robust infrastructure and effective promotional activities. This research provides actionable insights for stakeholders to create flexible strategies for sustainable apitourism development. Sobhani et al. (2023) investigated value co-creation in foreign language institutions in Tehran, Iran, utilizing a fuzzy DEMATEL ranking approach. This mixed-methods study began with thematic analysis to extract key themes, which were validated by 20 experts. A pairwise comparison matrix was then employed with input from 12 career specialists to rank five main fields and 27 mechanisms of value co-creation. The findings emphasize the importance of mutual engagement and satisfaction between institutions and customers, enhancing market performance in a competitive environment. These results provide a framework for foreign language institutions to strengthen co-creation mechanisms and foster better interaction with stakeholders.

Research Methodology

Data analysis was conducted using the DEMATEL method in this study. The DEMATEL (Decision-Making Trial and Evaluation Laboratory) technique is a powerful method used for analyzing and

visualizing the relationships among various factors in complex systems. It is particularly effective in identifying cause-and-effect relationships, which can help decision-makers understand the structure of a problem and prioritize actions based on the interdependencies of the factors involved. Here's a detailed explanation of the DEMATEL technique, including its methodology, applications, and advantages. DEMATEL is designed to analyze complex systems by identifying the interrelationships among various elements. It helps in understanding how different factors influence each other, allowing for a clearer picture of the system's dynamics (Foli et al., 2024; Si et al., 2018). The methodology of DEMATEL includes several steps: first, define the problem by identifying the factors that influence it through literature reviews or expert opinions. Second, construct the direct influence matrix by having experts provide pairwise comparisons of the influence of one factor on another using a scale (e.g., 0 to 4) to indicate the strength of influence, resulting in a direct influence matrix. Third, normalize the matrix to ensure the values are consistent and comparable. Fourth, calculate the total influence matrix from the direct influence matrix to show the overall influence of each factor on all others, including both direct and indirect influences. Finally, analyze the results to determine the centrality and causality of each factor, categorizing them into cause and effect groups based on their influence scores (Shanta et al., 2023; Tahir & Idris, 2024). The results can be visualized using causal diagrams, which depict the relationships between factors and indicate the strength of influence. This helps in understanding the structure of the problem and identifying key areas for intervention (Bisht et al., 2023; Wang et al., 2023). DEMATEL offers several advantages, including clarity in complex relationships, as it provides a clear understanding of how different factors interact, which is crucial for effective decision-making in complex environments (Akal et al., 2022; Kim & Nguyen, 2021). It incorporates a feedback mechanism that recognizes elements may not be independent, unlike some other decision-making methods (Nimawat & Gidwani, 2021; Tsou & Hsu, 2022). Additionally, the ability to visualize relationships through causal diagrams makes it easier for stakeholders to grasp complex interactions and prioritize actions (Liu et al., 2021; Sathyan et al., 2020). In this study, the researchers reached saturation with data after the 10th interview with managers and officials. Nevertheless, the interview process continued until the 14th participant was interviewed. During the seventh interview, a saturation of hospital hotel visitors was observed, but to make sure, the interviews continued until the 10th participant. The sample was selected using a purposive judgment method, which is a non-probabilistic approach. In this method, experts were selected who met the required criteria (e.g., playing a pivotal role, being recognized by others, having a theoretical understanding of the subject matter, diversity, willing to participate, relevant work experience, and appropriate education). They were also asked to introduce other experts in the field along with the research questions. Accordingly, other experts were also selected by other experts in addition to the criteria for expertise, apart from the first few individuals whom the researcher directly

selected. The sampling process continues until the answers to the interview questions are repeated. However, the DEMATEL method was established based on the judgment of the same fourteen experts who were administrators and managers of the hospital hotels and the Ministry of Health and Medical Education. Consequently, fourteen questionnaires were distributed from June to September 2022.

Data Collection and Analysis

Creating Initial Codes

In this study, the interview protocol was first developed based on literature reviews and university professors' opinions, and then the factors were identified.

During this phase, researchers seek to extract textual data based on rational benefits and comprehensible features. Therefore, codes are used to break down textual data into understandable and usable components, such as clauses, phrases, words, or other criteria required for a specific analysis. Coding frameworks must have clearly defined boundaries so they are not subject to change or repetition. The codes should also be limited to the research scope. Coding may be performed manually or through computer software. The present study used MAXQDA software for coding. The researcher first determined the codes of each interview after typing the interviews using word processing software. Each of these phrases is assigned a three-item code, for example, A4,9:

A: This refers to the individual participating in the research. Participants in the study's first phase, managers and employees of hospital hotels and the Ministry of Health, were assigned the letter A, which stands for Administrator, meaning an administrative manager. In the second phase, participants were also assigned the letter P, which stands for the patient.

4: The number 4 next to the letter A indicates that this is the fourth interview or the fourth interviewee.

9: The number 9 represents the ninth theme extracted from the interview text.

In summary, A4,9 refers to the ninth theme from the fourth participant in the first phase of the research. The results of this step are presented in Table 1.

The next step involved the abstraction process. Combining the basic themes with a common theme could give companies competitive advantages. As shown in Table 2, fourteen competitive advantages were derived from rational benefits and features (organizing themes).

As a next step, the identified factors were prioritized using the DEMATEL method. Then, a DEMATEL-related questionnaire was developed to explain the evaluation of the cause-and-effect relationship between the factors and was provided to the respondents. The questionnaire presented fourteen factors, and the experts were asked to rate the influence of each factor on the other factors. A causal relationship between the factors was determined after the questionnaires were collected using the DEMATEL method. The DEMATEL calculations were conducted using Microsoft Excel, which was

employed to construct the Direct Influence Matrix, normalize the values, and calculate the total influence metrics (R, C, R,,, R.... Eccel's fcnctionality ensured precision and ease of caluulation, facilitating reproducibility and transparency in the analysis process.

Table 1. Rational benefits of the Halal-branded hospital hotel

Basic themes (rational benefits)	Key sentences	Reference
Low wages for physicians	The salaries of Iranian doctors are comparable to those of European and American doctors and those of other doctors in our region. Despite this mentality within the country, our doctors receive relatively low salaries compared to their international counterparts.	A1, A2, A3, A4, A6, A7, A9, A10, A12, A14
Cost-savings on commuting	The principle behind hospital hotels is to eliminate some costs. Currently, when patients are in the hospital and their companions are staying in a hotel in a different part of the city, they incur a cost in terms of time, money, and distance. Having both patients and companions together eliminates these costs. It is one of the advantages of staying in a hospital hotel.	A2, A3, A5, A12, A13,
The high value of the dollar, dinar, and other currencies in Iran	Despite the recent changes in the value of Iranian currency, non-Iranians could spend their money more easily in Iran, i.e., their money gained value.	A1, A3, A8, A10, A12,

Table 2. Organizing themes

Row	Competitive advantage	Rational benefits and features
1	Low price	Low wages for physicians
		Cost-savings on commuting
		The high value of the dollar, dinar, and other currencies in Iran
		A fair supply chain because all employees are Muslims
		Cost-effective accommodations
2	Experienced, knowledgeable, and Muslim human resources (physicians, nurses, and staff)	Islamic medicine-trained doctors
		Science-based doctors
		Nurses with extensive experience and ethical standards
3	Halal financing	Receiving low-interest or interest-free loans
		Donations received from donors
4	Utilization of ICT	Familiarization of treatment personnel through virtual and electronic means
		Electronic medical records
		Computerization of medical prescriptions
		System for archiving images
		Remote medicine or telemedicine
		Electronic post-treatment training

5	Treatment measures	Establish the treatment schedule and practice
		Identify the roles and responsibilities of the physicians, nurses, employees, and other individuals involved in the patient's care
		Assign duties to family members and companions
		Daily monitoring of care plan progress
		Managing the treatment process
		Assessment of treatment success
		Follow-up on the patient's treatment after returning home/to the country of origin
6	Preventive therapy training	Describe the symptoms of the disease to the patient and companions
		Explain the disease incubation period to the patient and his or her companions
		Educate the patient and companions on how to handle suspicious cases
		Patient and companion education on prevention methods
		Provide essential care for patients and their companions
		Patient and companion instructions on how to use the tools
7	Facilities and programs for recreation	Programs for pilgrimages (existence of tombs of prophets, tombs of religious scholars, offspring of Imams, tombs of nobles and scholars, and tombs of religious authorities)
		Entertainment and tourist programs (planning to watch movies at the cinema, having well-equipped sports facilities, well-stocked libraries, an amphitheater, organizing pilgrimages, ensuring children and families' presence at amusement parks)
8	Family acceptance and hospitality	Staying close to family
		Family excursions
		Educate families about the disease
9	Worship arrangements	Establish the Qibla direction in the rooms
		Equip rooms with prayer mats and the Quran
		Calculate Sharia times according to local time
		Public prayer rooms in hotels
10	Halal and healthy nutrition	Diet food is not the only option on the menu
		Provide high-quality and pure food
		The availability of a nutritionist
		Ensure the quality of raw materials and food processing
11	A warm and sincere relationship with patients and their companions	Building relationships based on respect for the guests and maintaining their dignity
		Tools for instant translation
		Tourism-friendly behavior by people
		The availability of a translation service
12	An integrated admissions system	Information regarding the various steps involved in accommodation and treatment
		Specify the conditions for cost inquiries
		A transparent pricing policy
		Establishment of representative offices for health tourism in target countries
		Provide proper airport services

13	Different treatment strategies for successful treatment	Perform advanced clinical tests
		Conduct psychological tests
		Make use of sufficient and appropriate scientific publications
		Utilize the top-ranked universities in the region
		Employ medical teams with a wide range of specialties
		Utilize the services of committed and ethical private hospitals
		Assess the therapeutic poles' capacity for each patient
		Take advantage of natural healing capacities (hot springs, sand therapy, hydrotherapy, etc.)
14	A standard design and construction procedure	Building with a beautiful view and landscape
		Spacious and relaxing lobby and corridors
		Private rooms for patients and their families
		Pollution-free environment
		Noise-free environment
		Keeping the environment clean
		Having green spaces

Step 1: Create the Direct Impact Matrix

To construct the Direct Influence Matrix, a structured questionnaire was distributed among 14 experts, including managers, staff of hospital hotels, and Ministry of Health officials. Experts evaluated pairwise influences of criteria using a 5-point Likert scale (0: No influence to 4: High influence). Detailed guidelines ensured consistent scoring, and the arithmetic mean of responses formed the matrix, reflecting expert consensus for subsequent DEMATEL analysis.

This matrix represents the direct influence of each Competitive advantageon the others (Table 3), using a scale from 0 to 4.

Table 3. Direct Influence Matrix

Competitive advantage	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Low price	0	1	2	2	1	0	0	0	0	1	1	0	1	1
2. Experienced HR	1	0	1	2	3	2	0	0	0	2	3	2	1	1
3. Halal financing	2	1	0	1	1	1	0	0	0	1	1	0	0	1
4. Utilization of ICT	1	2	2	0	2	2	1	1	0	1	1	2	2	1
5. Treatment measures	1	2	1	2	0	3	2	1	1	2	2	3	2	2
6. Preventive therapy	0	1	1	2	3	0	2	2	1	2	2	1	2	1
7. Recreation facilities	0	0	0	1	2	2	0	2	2	2	3	1	1	2
8. Family hospitality	1	0	0	1	2	2	3	0	2	3	4	1	2	2
9. Worship arrangements	0	0	1	0	1	1	2	3	0	2	2	0	1	1
10. Halal nutrition	1	1	2	1	2	2	3	3	2	0	3	2	1	2
11. Patient relationships	1	2	2	1	2	2	3	3	2	3	0	2	3	2
12. Admissions system	1	2	2	3	3	2	2	2	1	2	2	0	2	1
13. Treatment strategies	2	1	2	2	3	2	1	2	1	2	3	2	0	2
14. Standard design	1	1	1	1	2	1	2	2	1	2	3	1	2	0

Step 2: Normalize the Matrix

Normalize the direct influence matrix to ensure all elements fall between 0 and 1. Table 4 shows the results of this step.

Table 4. Normalized Direct Influence Matrix

Competitive advantage	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Low Price	0	0.036	0.071	0.071	0.036	0	0	0.036	0	0.036	0.036	0	0.036	0.036
Experienced HR	0.036	0	0.036	0.071	0.107	0.071	0	0	0	0.071	0.107	0.071	0.036	0.036
Halal Financing	0.071	0.036	0	0.036	0.036	0.036	0	0	0.036	0.036	0.036	0	0	0.036
Utilization of ICT	0.036	0.071	0.071	0	0.071	0.071	0.036	0.036	0	0.036	0.036	0.071	0.071	0.036
Treatment Measures	0.036	0.071	0.036	0.071	0	0.107	0.071	0.036	0.036	0.071	0.071	0.107	0.071	0.071
Preventive Therapy	0	0.036	0.036	0.071	0.107	0	0.071	0.071	0.036	0.071	0.071	0.036	0.071	0.036
Recreation Facilities	0	0	0	0.036	0.071	0.071	0	0.071	0.071	0.071	0.107	0.036	0.036	0.071
Family Hospitality	0.036	0	0	0.036	0.036	0.071	0.071	0	0.107	0.107	0.143	0.036	0.071	0.071
Worship Arrangements	0	0	0.036	0	0.036	0.036	0.071	0.071	0	0.071	0.071	0	0.036	0.036
Halal Nutrition	0.036	0.036	0.071	0.036	0.071	0.071	0.071	0.107	0.071	0	0.107	0.071	0.036	0.071
Patient Relationships	0.036	0.071	0.071	0.036	0.071	0.071	0.107	0.143	0.071	0.107	0	0.071	0.107	0.071
Admissions System	0.036	0.071	0.071	0.071	0.107	0.036	0.036	0.036	0.036	0.071	0.071	0	0.071	0.036
Treatment Strategies	0.071	0.036	0.071	0.071	0.107	0.071	0.036	0.071	0.036	0.036	0.107	0.071	0	0.071
Standard Design	0.036	0.036	0.036	0.036	0.071	0.036	0.071	0.071	0.036	0.071	0.071	0.036	0.071	0

Step 3: Calculate the Total Influence Matrix

The total influence matrix TTT is displayed below (Table 5). Each value represents the total influence (direct and indirect) of one criterion on another.

Step 4: Determine Prominence and Relation

Calculate R (row sums) and C (column sums) to assess each criterion's importance (R+C) and role as a cause or effect (RCC). Table 6 shows the results of this step.

The results of the DEMATEL analysis provide valuable insights into the relationships and priorities among the criteria. The analysis reveals that "Treatment Measures" and "Family Hospitality" are the most influential criteria within the system. Their high RCCR-CRCC values indicate that these factors act as significant drivers, meaning improvements in these areas will lead to widespread positive effects on other aspects of the healthcare service. For instance, enhancing treatment procedures and fostering a welcoming environment for families can create a ripple effect, benefiting other criteria. On the other

hand, "Halal Financing" and "Worship Arrangements" are identified as the most dependent criteria, with the lowest RCCR-−R−C values. These criteria are heavily influenced by other factors in the system. This suggests that indirect improvements in areas like patient relationships or hospitality will likely enhance these dependent criteria without requiring direct intervention. The analysis also highlights the overall importance of certain criteria, such as "Treatment Measures," "Patient Relationships," and "Halal Nutrition," which have the highest R+CR+CR+C values. These criteria are central to the system because they are both influential and dependent. Addressing these factors effectively will contribute significantly to achieving the desired outcomes in healthcare delivery. Some criteria, such as "Preventive Therapy" and "Admissions yystem""have RCCR-CRCC values close to zero. This balance indicates that they play a stabilizing role in the system, acting neither as strong influencers nor as heavily dependent factors. These criteria respond proportionally to changes in the network and maintain equilibrium. Overall, the findings suggest that prioritizing improvements in "Treatment Measures," "Family Hospitality," and "Patient Relationships" should be the primary focus. These areas will drive the most substantial impact. At the same time, creating a supportive environment will naturally enhance dependent criteria like "Halal Financing" and "Worship Arrangements," ensuring a holistic and effective healthcare system.

Table 5. Total influence matrix

Competitive advantage	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Low Price	0	0.047	0.121	0.112	0.087	0.067	0.063	0.066	0.034	0.09	0.108	0.067	0.093	0.094
Experienced HR	0.07	0	0.066	0.115	0.159	0.135	0.084	0.098	0.058	0.143	0.185	0.145	0.14	0.133
Halal Financing	0.122	0.064	0	0.082	0.099	0.086	0.054	0.064	0.036	0.085	0.113	0.067	0.074	0.088
Utilization of ICT	0.071	0.115	0.122	0	0.146	0.125	0.085	0.098	0.046	0.119	0.136	0.135	0.133	0.119
Treatment Measures	0.085	0.124	0.099	0.128	0	0.182	0.125	0.127	0.064	0.161	0.183	0.177	0.169	0.163
Preventive Therapy	0.045	0.086	0.09	0.127	0.163	0	0.126	0.135	0.07	0.147	0.166	0.121	0.148	0.125
Recreation Facilities	0.034	0.05	0.041	0.084	0.126	0.112	0	0.135	0.108	0.161	0.184	0.102	0.126	0.145
Family Hospitality	0.074	0.057	0.048	0.085	0.132	0.134	0.149	0	0.108	0.2	0.246	0.123	0.152	0.16
Arrangements Worship	0.027	0.039	0.058	0.053	0.081	0.075	0.1	0.128	0	0.116	0.136	0.058	0.09	0.089
Halal Nutrition	0.071	0.091	0.114	0.108	0.141	0.134	0.16	0.179	0.117	0	0.221	0.139	0.145	0.173
Patient Relationships	0.07	0.112	0.112	0.094	0.139	0.13	0.164	0.179	0.108	0.207	0	0.13	0.18	0.174
Admissions System	0.072	0.111	0.117	0.141	0.162	0.125	0.122	0.131	0.072	0.145	0.167	0	0.143	0.125
Treatment Strategies	0.111	0.073	0.097	0.116	0.155	0.131	0.081	0.126	0.073	0.129	0.178	0.132	0	0.142
Standard Design	0.071	0.08	0.083	0.091	0.128	0.095	0.118	0.141	0.089	0.147	0.187	0.096	0.152	0

Table 6. Prioritization of Competitive advantageBased on Total Influence (R, C, R+C, and R-C Values)

Competitive advantage	R (Row Sum)	C (Column Sum)	R+C (Importance)	R-C (Cause/Effect)
Treatment Measures	2.153	1.752	3.905	0.401
Patient Relationships	2.006	1.88	3.886	0.126
Halal Nutrition	1.978	1.879	3.857	0.099
Family Hospitality	2.05	1.769	3.819	0.281
Admissions System	1.895	1.881	3.776	0.014
Preventive Therapy	1.856	1.854	3.71	0.002
Utilization of ICT	1.733	1.844	3.577	-0.111
Standard Design	1.576	1.675	3.251	-0.099
Treatment Strategies	1.636	1.634	3.27	0.002
Recreation Facilities	1.578	1.646	3.224	-0.068
Experienced HR	1.498	1.67	3.168	-0.172
Low Price	1.057	1.091	2.148	-0.034
Worship Arrangements	1.015	1.092	2.107	-0.077
Halal Financing	0.926	0.975	1.901	-0.049

Conclusion

This study provides valuable insights into the competitive advantages of hospital hotels in Islamic countries, focusing on an Iranian case study. The use of the DEMATEL (Decision-Making Trial and Evaluation Laboratory) method allowed for a comprehensive analysis of 14 critical criteria, such as treatment measures, family hospitality, halal nutrition, and worship arrangements. The results revealed that “Treatment Measures” and mmamily Hospitality” are the most influential factors in enhancing the overall quality of service in hospital hotels. These criteria, due to their direct and strong influence, serve as the key drivers in improving other interconnected aspects of hospital hotel operations, contributing significantly to the competitive advantage of these facilities. Furthermore, factors like "Halal Financing" and "Worship Arrangements" were found to be the most dependent, heavily influenced by other criteria in the system. This finding indicates that while these factors are crucial for a culturally aligned service, they are secondary in terms of their direct impact compared to other, more influential criteria.

The analysis also identified llal al Nutrition” and PPatient Relationships” as central elements in the success of hospital hotels. Both factors play a crucial role in shaping a holistic patient experience, underscoring the importance of catering to religious and cultural dietary needs, as well as fostering strong emotional connections between hospital staff, patients, and their families. These results can guide

hospital hotel managers and policymakers in prioritizing these influential criteria, ensuring a better cultural fit and higher patient satisfaction in their service offerings.

Based on the findings, it is recommended that hospital hotels in Islamic countries focus on enhancing treatment measures and family hospitality, as these are the key drivers for improving service quality and patient satisfaction. Special attention should also be given to strengthening aspects related to halal services, such as financing options and worship arrangements. These factors are essential not only for adhering to Islamic principles but also for differentiating hospital hotels in a competitive market. It is further recommended that hospital hotels adopt an integrated approach, considering the relationships between factors and aiming for continuous improvement across all areas to ensure a holistic patient experience.

While this study offers valuable insights, several limitations should be considered. First, the research sample was limited to experts from Iran, meaning the findings may not fully reflect the diverse cultural and operational practices of hospital hotels across other Islamic countries. Expanding the sample size to include multiple countries would provide a more comprehensive understanding of the competitive advantages in this context. Second, the DEMATEL method, while effective in identifying direct and indirect relationships, may not capture all dynamic aspects of the system, particularly those influenced by subjective perceptions and cultural nuances. Future studies could incorporate a combination of methods, such as qualitative interviews or surveys, to gain a deeper understanding of patient preferences and the broader societal context.

Additionally, the research primarily focused on hospital hotel managers and healthcare officials, so incorporating patient feedback from a wider demographic, including different regions within Islamic countries, would provide a more rounded perspective on the competitive advantages. Future research could also explore how factors like technology utilization and innovative healthcare services impact the competitiveness of hospital hotels, offering a broader view of the evolving market landscape. Overall, the stydy's findings offer a strong foundation for improving the management and service uuality of hospital hotels, with practical implications for enhancing both patient care and operational effectiveness in Islamic healthcare settings.

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