

Prioritization of Strengths, Weaknesses, Opportunities and Threats of Indian Medical Tourism Sector using Integrated Swot Ahp Analysis

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Abstract: Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis is a popular tool which examines strengths and weaknesses (internal factors) of an organization or industry together with opportunities and threats (external factors) of the marketplace environment. SWOT analysis is the best method to provide the basic outline to take strategic decisions. In this study, we have integrated SWOT analysis with multicriteria decision making technique called Analytic Hierarchy Process (AHP) to rank different strengths, weaknesses, opportunities and challenges of Indian medical tourism in order of prioritization. In AHP approach pairwise comparisons among factors or criteria is performed in order to prioritize them using the group priority scores calculation. The objective of using the integrated SWOT AHP method is to improve the quantitative aspect of strategic decision making process.

KEYWORDS: SWOT Analysis, AHP, Strategic decisions, Multiple Criteria Decision Making Technique, Medical Tourism.

III. INTRODUCTION

Healthcare industry is among one of the most rapidly growing industries in the world economy and is continuously faced by new issues and challenges. Healthcare systems have to respond to different challenges caused by cross border trade in delivery of health services through movement of healthcare service seekers, providers of healthcare services and different joint ventures and collaborations. (Chanda R, 2002) Now a days cross border trade is considered to be one of the best ways to create and finance the additional resources for healthcare industry in the developing nations of the world. (Siddiqi et al, 2009) New opportunities and challenges has been created by liberalization of trade in healthcare sector specially in middle and low income group nations to provide remarkable and efficient healthcare services. (Siddiqi et al, 2009)

1.1 Modes of supply of healthcare services

According to General Agreement on Trade in services (GATS) definitions, there are four modes of supply as far as trade in healthcare services is concerned. (Chanda R, 2002) They are listed as

MODE -1 Cross border delivery of trade

MODE – 2 Consumption of health services abroad

MODE – 3 Commercial presence

MODE – 4 Movement of health personnel

1.1.1 Cross border delivery of trade

This mode includes electronic delivery of healthcare services like pre and post care consultation and diagnosis which is also referred to as telemedicine services as well as movement of lab samples. Telemedicine or telehealth services includes the use of audiovisual aids and different data and information communication techniques to provide health

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services around the world at a distance by specialized clinicians. (Chanda R, 2002)

1.1.2 Consumption of health services abroad

This mode includes movement of patients to different countries for seeking medical procedures. Most of the times patients from underdeveloped countries or developing countries move to developed countries with better health care facilities for high quality treatment procedures or alternative medicine. (Chanda R, 2002) For example India is famous for high quality medical procedures at competitive prices and alternative medicine like yoga and ayurveda.

1.1.3 Commercial presence

This mode involves setting up hospitals, diagnostic centers, clinics in different countries. Various countries like India, Nepal, Thailand are open to foreign direct investment. For example a German company has been given approval to set up a 200 bedded hospital in Delhi and thus having 90% foreign equity ownership. Different Indian and foreign companies are collaborating to establish multispecialty hospitals in India.

1.1.4 Movement of health personnel

This mode includes the movement of health practitioners like doctors, nurses, paramedical professionals, technicians, trainers etc. from their home country to other countries. Various reasons causing cross border movement of healthcare professionals include wage differences between different countries, search for better exposure, training and better standards of living as well as good working conditions (Chanda R, 2002). This mobility seems to be more in nursing profession which consists of 70% healthcare staff and 80% of direct patient care services. There is imbalance between demand and supply in nursing profession (Cohen A, 1997).

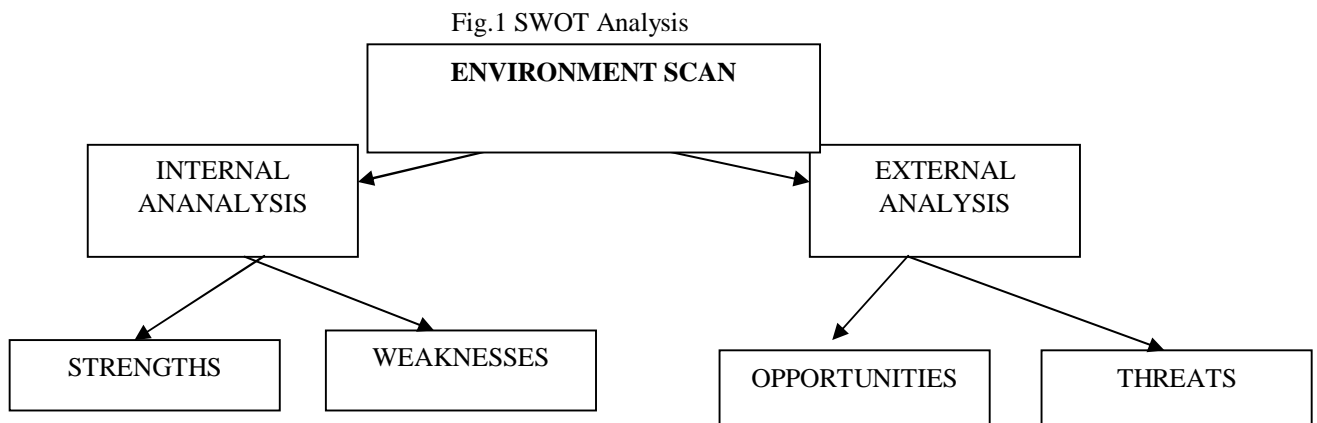
1.2 Objective of the study: In this study, we have focused on current strengths, weaknesses, opportunities and challenges of Indian medical tourism (from the attitude of providers).

The main objective of this research is to rank the strengths, weaknesses, opportunities and threats of Indian medical tourism and in this way to help policy makers so that they can allocate their resources in the best manner and use this ranking in their decision making process.

II. SWOT Analysis & AHP

2.1 SWOT Analysis

SWOT (the acronym standing for Strengths, Weaknesses, Opportunities and Threats) is a popular tool to analyze the internal and external environments of an organization to achieve a scientific and systematic approach to take strategic decisions. (see, e.g., Wheelen and Hunger, 1995, Hill and Westbrook, 1997). As far as strategic factors are concerned, the internal and external factors are the most important factors for an organization's future. In SWOT analysis these internal and external factors (also called SWOT factors) are categorized into four groups called SWOT groups: strengths, weaknesses, opportunities, and threats.



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Table 1: SWOT Analysis of Indian Medical Tourism

STRENGTHS <i>What strengths be able to achieve objectives</i>	WEAKNESSES <i>What weaknesses required to deal with it</i>
SI- Availability of exclusive wings S2- Alternative treatment like yoga & ayurveda S3- Strong pharmacy sector S4- Availability of highly skilled & expert doctors S5- Best technology & quality available in India S6- Infrastructure of Indian hospitals S7- Lesser cost of medical procedures S8- Privatization of healthcare sector S9 - Special dietary services for international patient	W1- Online preoperative counseling facility not frequently available W2- No agreement with insurance companies W3- Complicated disengagement of procedures & bill settlement W4- No Medico legal security for medical tourists W5- Air & water pollution in India W6- Tedious police verification clause for medical tourists W7- Level of patient service not at par
OPPORTUNITIES <i>What opportunities be able to employ</i>	THREATS <i>What threats required to be aware of</i>
O1- Treatment comparable to developed countries O2- Availability of international cuisines O3- Good coordination between wards & departments O5- Political stability O6- Economic recession O7- National health policy O8- Interpreter facility	T1- Online diagnostic facility T2- Clinical excellence T3- Inadequate transport facility T4- Connectivity from other countries no good T5- Medical visa costly T6- Cost of medical visa is inhibitive T7- Corruption in grant of visa T8- Extension of visa takes time T9- Two months cooling period is required for extension of medical visa T10- Unavailability of specialized procedures T11- Ethnic issues linked with MT

2.2 AHP

The primary step in the AHP technique is that a complex issue is divided into a structural (hierarchy) and aims & criteria are added (Borouhaki & Malczewski, 2008.) Aim is added at the top of the structure while criteria and sub criteria are put in the levels and sub-levels and decision alternatives are placed at the bottom of the structure.

The objective of integrating the Analytical Hierarchy Process (Saaty, 1977, 1980) with a SWOT framework is to do a systematic evaluation of the SWOT factors and make them consistent and appropriate according to their priorities (Kurttila et al., 2000). In SWOT analysis, the AHP's qualities are considered to have a valuable contribution. To add additional value to SWOT analysis pairwise comparisons between the SWOT factors are performed and analyzed with the help of the eigenvalue technique as a component of AHP.

Table 2: Pairwise comparison scale (Source: Saaty, 1996; Yüksel and Dağ deviren, 2007)

Importance	Explanation
1	Equally preferred
2	Equally to moderately preferred
3	Moderately preferred
4	Moderately to strongly preferred
5	Strongly preferred
6	Strongly to very strongly preferred
7	Very strongly preferred
8	Very to extremely strongly preferred
9	Extremely preferred

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2.3 AHP and SWOT

In AHP technique, pairwise comparisons between different evaluation factors is carried out in order to prioritize the factors using the eigen value calculation. In SWOT analysis, the weights of the factors are not taken into consideration to find out the effect of each factor on the proposed strategy alternatives (Yüksel, I. and Dağdeviren, M. 2007). SWOT analysis alone does not systematically determine the relative importance of the criteria. In order to overcome this insufficiency, the SWOT matrix is converted into a hierarchic structure and is integrated with AHP to find out the priority scores. (Kangas, J., Pesonen, M., Kurttila, M. and Kajanus, M. (2001). This method quantify the SWOT factors systematically by equating their priorities. Wickramasinghe, V. and Takano, S. (2010). The proposed method involves three steps:

- The first step is to enumerate and list the considerable internal (strengths and weaknesses) and external (opportunities and threats) factors for the strategic planning thereby making a SWOT framework. (Figure 1, Table 1)
- In the second step, pairwise comparison is done to calculate the weights of each SWOT group using Saaty's scale. (Table 2, 3). The prioritization process is obtained by assigning a number from a comparison scale developed by Saaty (1980) to add the relative importance of the criteria (Table 2).
- Finally in the third step, AHP technique is used to calculate the relative priorities of each factor within SWOT groups. Then the factors local weights are multiplied by specific group weight to calculate the overall factor weight rank. (Tables 5,6,7,8,9)

IV. DATA COLLECTION & ANALYSIS

3.1 Data Collection

A group of ten doctors, coordinators of international wings and top management personnel of three hospitals of Gurgaon were selected which includes Medanta Medicity Gurgaon, Artemis Hospital and Max Super speciality hospital Gurgaon. After several rounds and sessions of discussion, they ended up with nine strengths, nine weaknesses, eight opportunities and eight threats to consider in the strategic planning process.

Let $A = \{A_j | j = 1, 2, \dots, n\}$ be the set of criteria. The final result of the pairwise comparison on n criteria can be summed in an $(n \times n)$ matrix C in which every element $a_{ij}(i, j = 1, 2, \dots, n)$ is the quotient of weights of the criteria. This pairwise comparison can be depicted by the following equation:

$$\begin{array}{c|cccc}
 K & A_1 & A_2 & \dots & A_n \\
 \hline
 A_1 & 1 & a_{12} & \dots & a_{1n} \\
 A_2 & 1/a_{12} & 1 & \dots & a_{2n} \\
 \vdots & \vdots & \vdots & \vdots & \vdots \\
 A_n & 1/a_{1n} & 1/a_{2n} & \dots & 1
 \end{array}$$

4.2. Data Analysis:

3.2.1 AHP Calculation:

Table 3: Pairwise comparison of SWOT factors:

SWOT Factors	S	W	O	T	4 th Root	Priority Vector
S	1	3	1	3	1.732	0.3773
W	0.333	1	0.25	2	0.6387	0.1391
O	1	4	1	2	1.6817	0.3664
T	0.333	0.5	0.5	1	0.5371	0.1170
Sum	2.666	8.5	2.75	8	4.5895	1.000
Sum PV	1.0058	1.1823	1.0076	0.936	4.1317	

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The Consistency Ratio (CR) indicates the consistency in making the pair-wise comparisons. Calculating the Consistency Ratio (CR) is a four-step process.

- First, the pair-wise comparison values in each column are added together (as the “Sum” values) and each sum is then multiplied by the respective weight (from the “Priority vector” column) for that criteria. The row labeled “Sum PV” shown in the matrix above. shows the result of multiplying the respective sum (shown in the row immediately above) by the respective weight for that criteria (shown in the column labeled “Priority vector”).
- In the second step, the aforementioned values (shown in the row labeled “Sum*PV”) are added together to yield a total of 4.1317 (i.e.,1.0058+ 1.1823 + 1.0076 +0.936= 4.1317). This value is known Lambda-max.
- In the third step, the Consistency Index (CI) is calculated.
The formula is: $CI = (\text{Lambda-max} - n) / (n-1)$ where n is the number of criteria or systems being compared. In this case, n= 4, for the three different criteria being compared. For this particular case, the calculation is:
 $4.1317-4 / 4 = 0.032$
- In the last step, Consistency Ratio (CR) is calculated by dividing the Consistency Index (CI) (from the previous step) by a Random Index (RI), which is determined from a lookup table. The Random Index (RI) is a direct function of the number of criteria or systems being considered.(Table 4)

Table 4 Random Consistency index (Saaty & Forman, 1993)

N	1	2	3	4	5	6	7	8	9	10
RI(Random Index)	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49

The matrix will be consistence and acceptable if consistency ration is less than 0.1 or)1.0 ($CR \leq$, if not we have to revise the subjective judgement.

- In general, the Consistency Ratio (CR) is calculated as: Consistency Ratio (CR) = Consistency Index (CI) / Random Index (RI) `In this case, n= 4 because four criteria are being compared, and so the Random Index (RI) equal to 0.90 (from the table) must be used. Therefore, $CR = CI / RI = 0.039/0.90 = 0.03$.
- The Consistency Ratio (CR) tells the decision-maker how consistent he/she has been when making the pair-wise comparisons. If the Consistency Ratio (CR) <0.10, the decision-maker’s pair-wise comparisons are relatively consistent. In this case the CR equals 0.03, which means that the *pairwise* comparisons are relatively consistent and no corrective action is necessary.)

Table 5: Pairwise comparison matrix for Strengths:

Strengths	S1	S2	S3	S4	S5	S6	S7	S8	S9	Priority vector
S1	1	7	3	3	1	0.33	0.33	1	5	0.1409
S2	0.142	1	5	3	5	3	3	5	7	0.2342
S3	0.33	0.2	1	1	1	0.5	0.2	0.25	3	0.0597
S4	0.33	0.33	0.33	1	1	1	1	3	3	0.0649
S5	1	0.2	1	1	1	5	5	1	5	0.1352
S6	3	0.33	2	1	0.2	1	1	5	5	0.1228
S7	3	0.33	5		0.2	1	1	7	7	0.1457
S8	1	0.2	4	0.33	1	0.2	0.142	1	7	0.0676
S9	0.2	0.142	0.33	0.33	0.2	0.2	0.142	0.142	1	0.0295
										1.000

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Table 6: Pairwise comparison matrix for Weaknesses:

Weaknesses	W1	W2	W3	W4	W5	W6	W7	Priority Vector
W1	1	3	5	3	7	4	7	0.367
W2	0.33	1	3	3	0.142	1	0.142	0.077
W3	0.2	0.33	1	3	7	3	0.2	0.149
W4	0.33	0.33	0.33	1	0.142	3	0.2	0.035
W5	0.142	7	0.142	7	1	5	3	0.160
W6	0.25	1	0.33	0.33	0.2	1	0.2	0.030
W7	0.142	7	5	5	0.33	5	1	0.178
								1.000

Table 7: Pairwise comparison matrix for Opportunities:

Opportunities	O1	O2	O3	O4	O5	O6	O7	Priority Vector
O1	1	7	3	5	3	7	5	0.146
O2	0.142	1	0.33	5	3	7	5	0.0615
O3	0.33	3	1	5	1	5	3	0.0067
O4	0.2	0.2	0.2	1	0.2	3	0.5	0.0146
O5	0.33	0.33	1	5	1	5	3	0.0461
O6	0.142	0.142	0.2	0.33	0.2	1	0.2	0.0887
O7	0.2	0.2	0.33	2	0.33	5	1	0.0220
								1.000

Table 8: Pairwise comparison matrix for Threats:

Threats	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	Priority Vector
T1	1	0.2	1	0.25	3	1	3	3	1	3	0.33	0.064
T2	5	1	5	3	5	5	7	9	5	3	5	0.28
T3	1	0.2	1	0.33	3	0.33	5	7	1	2	0.5	0.068
T4	4	0.33	3	1	3	3	5	7	3	5	7	0.203
T5	0.33	0.2	0.33	0.33	1	0.5	3	7	0.33	3	0.33	0.049
T6	1	0.2	3	0.33	2	1	3	5	3	5	0.33	0.09
T7	0.33	0.142	0.2	0.2	0.33	0.33	1	1	0.33	0.5	3	0.022
T8	0.33	0.11	0.142	0.14	0.142	0.2	1	1	0.33	0.142	0.2	0.016
T9	1	0.2	1	0.33	3	0.33	3	3	1	3	0.33	0.06
T10	0.33	0.33	0.50	0.2	2	0.2	2	7	0.33	1	0.33	0.038
T11	3	0.2	2	0.142	3	3	3	5	3	3	1	0.11
											1.000	

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Table 9: Overall priority scores for SWOT Factors:

SWOT Group	Group Priority	SWOT Factors	Factor Priority within group	Overall priority	Rank
STRENGTHS	0.3773	SI- Availability of exclusive wings	0.1409	0.0531	3
		S2- Alternative treatment like yoga & ayurveda	0.2342	0.0883	1
		S3- Strong pharmacy sector	0.0597	0.0225	8
		S4- Availability of highly skilled & expert doctors	0.0649	0.0244	7
		S5- Best technology & quality available in India	0.1352	0.0510	4
		S6- Infrastructure of Indian hospitals	0.1228	0.0463	5
		S7- Lesser cost of medical procedures	0.1457	0.0549	2
		S8- Privatization of healthcare sector	0.0676	0.0255	6
		S9 - Special dietary services for international patient	0.0295	0.0111	9
WEAKNESSES	0.1391	W1- Agreement with insurance companies	0.367	0.0510	1
		W2- Online preoperative counseling facility	0.077	0.0107	5
		W3- Disengagement of procedures & bill settlement	0.149	0.020	4
		W4- Medico legal security for medical tourists	0.035	0.0048	6
		W5- Air & water pollution in India	0.160	0.0222	3
		W6- Police verification clause for medical tourists	0.030	0.0041	7
		W7- Level of patient service	0.178	0.0247	2
OPPORTUNITIES	0.3664	O1- Comparable treatment	0.3993	0.146	1
		O2- Availability of international cuisines	0.16803	0.0615	3
		O3- Good coordination between wards & departments	0.18229	0.0067	7
		O4- Political stability	0.04004	0.0146	6
		O5- Economic recession	0.12585	0.0461	4
		O6- National health policy	0.2422	0.0887	2
		O7- Interpreter facility	0.06015	0.0220	5
		T1- Online diagnosis facility	0.064	0.0074	6

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THREATS	0.1170	T2- Clinical excellence	0.28	0.032	1
		T3- Adequate transport	0.068	0.0079	5
		T4- Connectivity from other countries	0.203	0.0237	2
		T5- Medical visa costly	0.049	0.0057	8
		T6- Cost of medical visa more	0.09	0.010	4
		T7- Corruption in grant of visa	0.022	0.0025	10
		T8- Extension of visa takes time in India	0.016	0.0018	11
		T9- Two months cooling period is required for extension of medical visa	0.06	0.0070	7
		T10- Availability of specialized procedures	0.038	0.0044	9
		T11- Ethical issues linked with MT	0.11	0.0128	3

V. RESULTS

Data obtained from the questionnaires was entered in excel and prioritized using Multiple Attribute Decision Making (MADM) approach (AHP method). The judgments of subjects were varied in form and depth. While one may not indicate his/her preferences at all, another may represent his/her preference through some alternative or attribute. Also degree of judgment skill also varies. To meet this varied situational judgment multi attribute decision making methods (MADM) because of the structure of questionnaires that included various factors under strengths, weaknesses, opportunities or challenges and AHP is a multi-criteria decision making method that utilizes hierarchical formation to show a problem and then develop priorities for alternatives based on the decision of the user (Saaty, 1980). AHP has been developed by Thomas Saaty in 1970 to assist decision makers to solve unstructured problems in social, economic, military analysis and, management science. This method is an appropriate method for complex decision that involves the comparison of decision

In this study, in the first step strengths, weaknesses, opportunities and challenges of globalization of health in context to India were identified. Challenges are all factors restricting entering this industry which may be an unfavorable condition in the industry's environment which creates a risk for, or causes damage to, the Indian medical tourism industry. Strengths and weaknesses look inward at the resources and experiences of the industry. Strength is an inherent capacity which an industry can use to gain strategic advantage. A weakness is an inherent limitation or constraint which creates strategic disadvantages. An opportunity is a favorable condition in the service industry which enables it to consolidate and strengthen its position. In this way, 9 strengths, 7 weaknesses, 12 opportunities and 11 threats were identified.

In the other step with AHP method data was prioritized for the strengths, weaknesses, opportunities and challenges of Indian Medical tourism.

VI. DISCUSSION & CONCLUSION

In this paper, we have determined significant strategic factors to organization by combining SWOT with AHP techniques. The findings show the ranking of each SWOT group priority.

SWOT analysis of medical tourism sector in India show that as per international patients perspective alternative treatment facilities like yoga and ayurveda has emerged out to be the biggest strength and cost of medical procedures which is comparatively lesser than developed countries is ranked as the second biggest strength. India offers ample

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opportunities in the medical tourism sector as it offers cheaper treatment in comparison to developed countries like USA and UK where 46.6 million people are uninsured and apart from high cost of medical treatments there are long waiting lists for surgeries for UK patients (Starr Sered and Fernandopulle, 2005; Aston, 2006; Milstein and Smith, 2006a; Horowitz, 2007). Infrastructure of Indian hospitals at par to that of developed countries along with provision of exclusive wings for medical tourists are another strengths. Medical tourists choose India as their favorable destination because of the key opportunities in Indian healthcare sector in the form of efficient infrastructures and technology. Skilled and expert workforce in Indian hospitals is another strength which is able to handle any type of medical complications. Most of the doctors and surgeons at Indian hospitals are trained or have worked at some of the medical institutions in the US, Europe, or other developed nations. Indian nurses are among the best in the world.

Pharmacy sector in India is ranked eighth in strengths in Indian hospitals. Dietary services is the area which is ranked least by the subjects enrolled for measuring Indian hospital perspective of globalization of health showing that food service area needs improvement as per the demands of medical tourists from different countries. As per information provided by the subjects around 35% of medical tourists were not happy with the quality of food served. Companions of the patients also suffered the same problem indicating that this area has to be seriously looked upon. No agreement of hospitals with insurance companies for medical tourists was ranked first as weakness of Indian medical tourism. Only some of the hospitals in India have tie ups with insurance companies which makes treatment difficult to afford for medical tourists. Another weakness of Indian medical tourism is police verification and provision of medico legal security for medical tourists. The medical visa category has been recently introduced in India but, due to the cumbersome police verification clause, the International Patient Service division in hospitals recommends that foreign patients fly on a regular tourist visa. Extension on medical visa is granted on medical grounds only thereby warranting the stay of the patient in India for urgent medical attendance. One threat of globalization of healthcare services with regard to Medical tourism industry is the area of public sector health inequity. Private hospitals mainly cater to medical tourists causing a brain drain of workforce from public to private hospitals. Comparatively high level of problems are reported by medical tourists pertaining to factors such as air and water pollution, heavy rush, beggars, health care and sanitary conditions.

National Health Policy of 2002 for promoting medical tourism in India is better suited for primary and secondary care rather than tertiary medical care. There is monopoly of private enterprises in medical tourism sector and the Government participation is very less in promoting it. Political stability in India combined with experienced, skilled consultants and infrastructure of Indian hospitals at par to developed countries with internationally acclaimed super-specialists are the major growth drivers of Internationalization of Indian Healthcare services. Results of this study can be used for the developing appropriate strategies for medical tourism sector in India. In future research, fuzzy logic framework can also be used with the AHP method to analyze the results more effectively.

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