

# Bibliometrix analysis of medical tourism

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## Abstract

Medical tourism is an expanding phenomenon. Scientific studies address the changes and challenges of the present and future trend. However, no research considers the study of bibliometric variables and area of business, management and accounting. This bibliometric analysis discovered the following elements: (1) The main articles are based on guest services, management, leadership principles applied, hotel services associated with healthcare, marketing variables and elements that guide the choice in medical tourism; (2) The main authors do not deal with tourism but are involved in various ways in the national health system of the countries of origin or in WHO; (3) cost-efficiency and analytical accounting linked to medical tourism structures and destination choices are not yet developed topics.

## Keywords

bibliometrix, biblioshiny, medical tourism, medical tourism agenda, medical tourism management

## Introduction

“Medical tourism” is a growing theme in the literature that receives more and more attention from academics and professionals worldwide (figure 1). Normally the term medical tourism associates surgical activities and tourist.<sup>1</sup> “Medical tourism” literature associates various aspects related to wellness.<sup>2</sup> “Medical tourism”, however, is very often linked to the search for better outcomes related to treatments than those offered in the country of origin and very often refers to shifts from more productive contexts to poorer countries in exchange for a higher quality of the hard ones.<sup>3</sup> “Medical tourism” has been growing for many different reasons. According to various authors, the reasons why “Medical tourism” is on the rise are connected to increased number in waiting lists in developed countries,<sup>3–6</sup> international exchange rates, low-cost services in developing countries,<sup>4,7–10</sup> technology and modern equipment compatible with the new health services.<sup>11</sup> Systematic analyses of the literature that try to define the phenomenon of “Medical tourism” by studying are available,<sup>12</sup> although the study by Gosh and Mandal<sup>12</sup> focuses on the factors that influence the perception of the quality of medical tourism and loyalty to the medical destination, identifying treatment, medical service, medical tourism infrastructure, destination appeal, destination culture, and communication convenience among the critical factors

related to two variables called. The analysis is limited and focused on the sample of Indian medical tourism. Despite the in-depth analysis confirmed by questionnaires, it does not provide an overview of the generalizable phenomenon that encourages the researchers to investigate all the factors and particularities of “Medical Tourism”. Furthermore, there are no bibliometric analyzes on the subject in the literature. Meta-analysts sometimes includes “grey literature” in their evidential base, which includes unpublished studies and studies published outside widely available journals;<sup>13</sup> the analysis conducted excludes grey literature and considers only scientific articles in peer-review as the correct methodological approach to guarantee results justified by correctness in the methodological and result approach.<sup>14</sup> The analysis conducted tries to define the trend and the phenomenon in order to guide future research on the topic.

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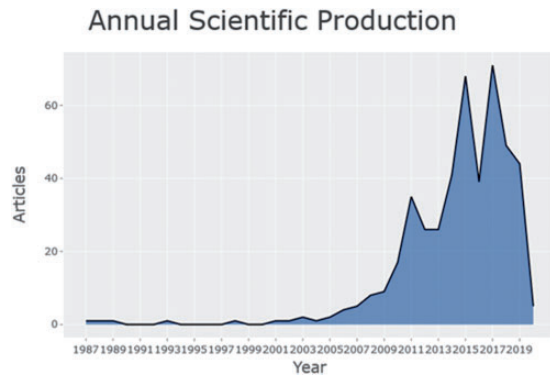
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**Figure 1.** Annual scientific production – “Medical tourism”.

Using bibliometrics it is possible to identify the essential quantitative variables of a particular research stream.<sup>15</sup> It is also possible to follow the five recommended science mapping workflow steps.<sup>16</sup> To conduct the analyses, we used the “bibliometrix” R package.<sup>17</sup> Additionally, “biblioshiny”, a shiny app providing a web-interface for bibliometrix, was used for the creation of topic dendrogram, conceptual map and trend topic figure. Moreover, to make it possible to analyse the most active geographical areas, we picked out the main keywords using a conceptual chart to identify more specific research fields and to identify and read the most cited papers. For these reasons, the following multiple research questions were used<sup>18</sup>:

Q1: What is the trend of scientific publication in the “Medical tourism” field in the world?

Q2: What information is left uncovered considering this trend?

Q3: which can be considered the future directions of the research in this field? this bibliometric analysis aims to

- a. Provide bibliometric information of 459 scientific studies which were extracted from the Scopus database;
- b. Use the software R with bibliometrix codes and biblioshiny to obtain and record the quantitative data in the different articles selected;
- c. Use variables as authors per article and the author’s dominance index to understand the leading authors in this research area;
- d. Use citations analysis and collaboration map to understand the network of this research stream;
- e. Study countries to evaluate production, citations and network within each country.

Finally, the paper is organised as follows. In the following section two, the main related works in this field are listed. Section 3 provides the methodology phases

used. Section 4 shows the findings, including all the relevant bibliometrics variables. The last section concludes the paper with future implication for research.

## Related works

In the literature, there are systematic analyzes conducted several years ago that may be useful in identifying the most significant elements on the topic. As most of the studies show, it uses the keyword “Medical tourism”, identifying the main topics covered, only one article uses other keywords in an association such as “Trade in Health Services” and “Medical tourism”.<sup>19</sup> The previous conception of “Medical tourism” mainly considered medical aspects, and in tiny percentage topics related to management and accounting, the main ones being related to marketing and analysis of the quality of the services received and the relative costs. All the articles focus on the risk of infections related to the primary healthcare activities required, namely commercial organ transplantation, cosmetic surgery, dental care, coronary angioplasty, total hip replacement, total knee replacement, and fertility treatments. The analysis of the literature also highlights the presence of analyses related to the decision making process of patients to choose the tourist destination for medical purposes identifying three main schemes: 1) procedures-based; 2) travel-based; 3) cost-based.<sup>19</sup> If for some countries it is an opportunity (Thailand, Singapore, Hungary, Argentina, Malaysia, Cuba, Israel, Brazil, Jordan, Turkey, and India) the phenomenon can become a risk for residents of more developed countries for post-operative costs to be bared in the countries of origin including in particular the USA, Canada, and UK.<sup>19–23</sup> There are numerous unexplored themes that literature reviews recommend exploring. Through bibliometrics analysis we conducted it has been possible to identify the trends and topics still unexplored.<sup>24</sup> The topics that, according to previous analyses, still need to be analysed were show to be: studies of demographics, motivations, treatment outcomes, and cost benefits of “Medical tourism”, the gap on the topic linked to a multidisciplinary analysis, the need to collect economic data related to each health service and related tourism activities at the national and international level to allow analysis and comparisons, analysis of the relationships between international health systems, systematic analyzes of the phenomenon in each country.<sup>19–22</sup>

## Methodology

The methodology of this study includes five main phases. The process of this study includes (1) Study Design, (2) Data Collection, (3) Data Analysis (4) Data Visualization, and (5) Interpretation (Aria &

Cuccurullo, 2017; Börner et al., 2003; Cobo et al., 2011; Zupic & Cater, 2015.

### Study design

The study starts with the definition of three research questions. The term “Medical tourism” has been selected as the primary keywords in the Scopus database. According to,<sup>26</sup> two are the main methods of picking keywords. First, the use of publication keywords from a high level; second, using essential keywords that identify a large research field and their relationship at the micro-level. The paper adopts the second technique. In fact, the phrase “Medical tourism” represents a vast search fields which includes 3329 results on Scopus. Afterword’s the work has focused on the knowledge structure on the topic consideration materials published in English journals between 1987 and January 2020, in peer review selecting area of business, management and accounting. The analysis has enabled to find 459 relevant. The number has reduced due to the limitation consider.

### Data core choose

The second step includes the use of open-source statistical application R to construct the business model. The stage of data collection allows creating the “.bib” file ready for the next phase.

### Data analysis

In this third phase, the software R and the bibliometrix codes have been used to create descriptive bibliometric analysis and to create a matrix able to include classify including all the documents. Additionally, “biblioshiny”, a web-interface for bibliometrix, was used for the creation of a conceptual map and co-citation network.

### Data visualisation

The analysis of the results then continued with the visualization of them using data reduction technique.

### Interpretation

Finally data have been interpreted

**Bibliometric analysis.** The analysis of the results starts with the essential description of the main bibliometric statistics. Afterwards, the investigation continues considering authors indicators and information. Finally, countries are considered. Each of this main category are then thoroughly analysed considering the following details: (1) type of document, (2) annual scientific production, (3) Scientific sources, (4) Source growth, (5)

Number of articles per author, (6) Authors’ dominance ranking, (7) Author’s keywords, (8) Topic dendrogram, (9) Factorial map of the document with the highest contributes, (10) Articles’ citation, (11) Country’s production, (12) Country’s citation, (13) Country collaboration map, and (14) Country collaboration network.

## Results

### Descriptive bibliometric analysis

Table 1 shows the essential extracted information of 459 articles published between 1987 and January 2020 from the Scopus database. Those articles have been published in 69 sources consisting mainly in scientific journals. The number of keywords used is nine times higher than the number of relevant items. At the same time, “keywords plus” that is the number of keywords that frequently appear in the article’s title is four times higher than the number of articles. The analysis period covers 13 years of scientific production. However, the most significant increase in publication has occurred in the last ten years (Graph 1). On average, each article is written by two authors (2.36);and, the Collaboration Index (CI) which is designed as Total Authors of Multi-Authored Articles(Total Multi-Authored Articles) is 2.24.<sup>27</sup>

We have already seen that 459 peer-reviewed scientific articles have been considered. The distribution of the articles does not present a significant concentration. However, Table 2 highlights that Journals specialize in “Medical tourism”. The table make visible the fact that, except for the journal “New Business Opportunities in The Growing E-Tourism Industry”, all journals deal with either tourism or health or health services. The

**Table 1.** Main information.

Description	Results
Documents	459
Sources (Journals, Books, etc.)	188
Keywords Plus (ID)	747
Author’s Keywords (DE)	1134
Period	1987–2020
Average citations per documents	12,44
Authors	852
Author Appearances	1083
Authors of single-authored documents	109
Authors of multi-authored documents	743
Single-authored documents	127
Documents per Author	0,539
Authors per Document	1,86
Co-Authors per Documents	2,36
Collaboration Index	2,24

**Table 2.** Sources that involves “Medical tourism”.

Sources	Articles
TOURISM MANAGEMENT	35
CURRENT ISSUES AND EMERGING TRENDS IN “MEDICAL TOURISM”	25
“MEDICAL TOURISM” AND WELLNESS: HOSPITALITY BRIDGING HEALTHCARE (H2H)	21
JOURNAL OF TRAVEL AND TOURISM MARKETING	15
ASIA PACIFIC JOURNAL OF TOURISM RESEARCH	14
CURRENT ISSUES IN TOURISM	13
INTERNATIONAL JOURNAL OF TOURISM RESEARCH	11
TOURISM REVIEW	11
HEALTH MARKETING QUARTERLY	9
INTERNATIONAL JOURNAL OF PHARMACEUTICAL AND HEALTHCARE MARKETING	9
JOURNAL OF TRAVEL RESEARCH	7
TOURISM	7
TOURISM RECREATION RESEARCH	6
AFRICAN JOURNAL OF HOSPITALITY TOURISM AND LEISURE	5
JOURNAL OF ENVIRONMENTAL MANAGEMENT AND TOURISM	5
JOURNAL OF HEALTHCARE MANAGEMENT	5
JOURNAL OF QUALITY ASSURANCE IN HOSPITALITY AND TOURISM	5
NEW BUSINESS OPPORTUNITIES IN THE GROWING E-TOURISM INDUSTRY	5
TOURISM MANAGEMENT PERSPECTIVES	5
ANNALS OF TOURISM RESEARCH	4

table clearly that the subject tourism and health services is intermix plenary as there is no evidence of a unique and specific attention to the topic. Most on the topic are those related to tourism and tourism policies.

The journals that deal with the topic and related issues can be visualized very well in figure 2 where the growth of publications is represented. Between 2005 and 2020, it is possible to notice a significant growth in publications on the topic.

### Authors

This section identifies the most cited authors regarding “Medical tourism”. In this section, it is also possible to identify the author’s keywords, dominance ranking factor, and total citations. Table 3 identifies the authors and their publications in the 20 top rankings. Analyzing the table, Demicco is the author with the highest number of publications,<sup>28–40</sup> fifteen, followed by Connel<sup>1,2,41–46</sup> and Han<sup>47–55</sup> with nine publications, Medhekar<sup>56–60</sup> and Na with seven, Frederick,<sup>61–67</sup> Gan,<sup>62–67</sup> Smith,<sup>68–73</sup>

Cooper<sup>25,74–78</sup> and with six and Eto<sup>79–82</sup> and Lee<sup>83–87</sup> with five the all others author have fewer than five publications. There is therefore a significant knowledge of the first authors on the subject with insights and updates over time. Some authors have published as primary authors, while most have published as co-authors. For this reason, it is necessary to measure the contributing power of each author. This was done by investigating the dominance ranking factor in the next section.

### Authors’ dominance ranking

The dominance factor (DF) is a ratio which measures the fraction of multi-authored articles in which an author acts as the first author.<sup>88</sup> Several bibliometric studies use the DF factor in them analyses.<sup>27,89</sup> The DF ranking calculates the author’s dominance in producing articles. The DF factor is the proportion of a number of multi-authored papers of the author (Nmf) is divided by the total number of multiauthored papers of the author (Nmt). In the single author case, this is omitted due to its constant value of “one” for single-authored papers. The mathematical equation for the DF factor is shown as:

$$DF = Nmf/Nmt$$

Table 4 lists the leading top 20 DF rankings and highlights that Debata Bikash Ranjan, Smith Melanie and Dryglas Diana (who appeared with four publications the first two and three the third), are the firsts and foremost authors in publications with multi-authors articles. This ranking continues with Gan Lydia and other authors who have published more items with less ranking by DF, as they appear as the first author in their research team. In-depth research shows that Debata Bikash Ranjan is an assistant professor at Rourkela Institute of Management Studies, Rourkela, India. Through his studies, he has carried out various analyses on emerging markets and “Medical tourism”. Prof. Melanie Smith is an assistant professor at Budapest Business School Department of Commerce, Catering & Tourism, has carried out various research, teaching and presented her results in numerous conferences related to tourism and wellness. Diana Dryglas, PhD is Assistant Professor at the Department of General Geology and Geotourism, AGH University of Science and Technology, Krakow, Poland. The author’s research interests focus on the management of a tourism product and tourism destination, and health tourism, especially therapeutic and healing tourism. The provenance from different research fields confirms the interdisciplinary attitude of the topic and a higher propensity to deal with the topic more from the managerial point of view closely linked to tourism point of view than from the health one. The

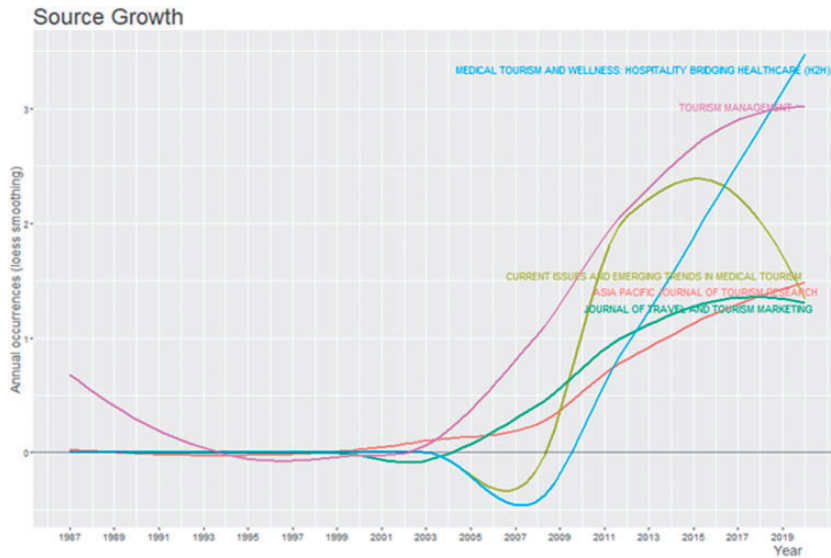


Figure 2. Source growth.

Table 3. Authors with a number of articles.

Number of articles	Authors (top 20)
15	DEMICO FJ
9	CONNELL J HAN H
7	MEDHEKAR A NA NA
6	FREDERICK JR GAN LL SMITH M
5	COOPER M ETO H LEE TJ
4	LUBOWIECKI-VIKUK A PARDO P REISMAN D STONE PR ZAILANI S GUIRY M KUEN E AJMERA P

following section investigates and discusses the main keywords used for the specific research area by showing which keywords identify “Medical tourism”.

**Author’s keywords**

This section provides information between the keyword’s “Medical tourism”. Researchers insert multiple keywords into the articles. This analysis is essential to determine the research trend, identify any gaps in

“Medical tourism” and identify the fields that can be interesting as research areas. Table 5 highlights the total number of keywords per author in the top 20 positions. The ranking is Health care, tourist destination and tourism. These elements are not predictive and recall the keywords used. But if we focus on the following keywords, we find important aspects of management and accounting related to “Medical tourism” such as organization of “Medical tourism”, marketing, the organization of health services and travel and decision-making activities. The most measured outcome is the quality of the product service and some keywords recall interdisciplinary.

The TreeMap highlights the combination of possible keywords. These can be identified from Figure 3 and we can say what they represent “Medical tourism” research field represented in Figure 4 by order of magnitude also through the word cloud.

On the other side, the dendrogram in Graph 3 represents the hierarchical order and the relationships between the keywords spotted by hierarchical clustering. The representation weights each object according to the clusters and measures the links among them. In other words, each object refers to a series of keywords associated with “Medical tourism” topic.

The detectable clusters have been divided into two broad groups. Considering the first one, it is possible to observe that studies have resulted to be divided into two strands, one linked to socio-demographic characteristics, the other focused on tourism and healthcare services management issues. In the first strand, older and middle-aged people have been analyzed considering gender to highlight the possible impact of those

**Table 4.** Author's dominance.

Author	Author dominance	Dominance factor	Total articles	Single-authored	Multi-authored	First-authored	Rank by articles	Rank by DF
1	DEBATA BR	1	4	0	4	4	7	1
2	SMITH M	1	4	2	2	2	7	1
3	DRYGLAS D	1	3	0	3	3	1	1
4	GAN LL	0.8333333	6	0	6	5	13	4
5	HAN H	0.7500000	9	1	8	6	18	5
6	MEDHEKAR A	0.7500000	9	1	8	6	18	5
7	JOHNSON TJ	0.6666667	3	0	3	2	1	7
8	LOVELOCK B	0.6666667	3	0	3	2	1	7
9	DEMICCO FJ	0.5000000	15	5	10	5	20	9
10	COOPER M	0.5000000	5	1	4	2	11	9
11	GUIRY M	0.5000000	4	0	4	2	7	9
12	LEE J	0.4000000	5	0	5	2	11	12
13	IRANMANESH M	0.3333333	3	0	3	1	1	13
14	LOVELOCK K	0.3333333	3	0	3	1	1	13
15	MCKERCHER B	0.3333333	3	0	3	1	1	13
16	MOGHAVVEMI S	0.2857143	7	0	7	2	16	16
17	MUSA G	0.2857143	7	0	7	2	16	16
18	GARMAN AN	0.2500000	4	0	4	1	7	18
19	FREDERICK JR	0.1666667	6	0	6	1	13	19
20	ZAILANI S	0.1666667	6	0	6	1	13	19

**Table 5.** Author's keywords in "Medical tourism".

Words	Occurrences
"Medical tourism"	85
Health care	34
Tourist destination	33
Tourism	26
Human	24
Tourism development	24
Humans	23
Tourist behavior	23
Tourism market	22
Health services	19
Marketing	19
Tourism management	18
Travel behavior	18
Female	17
Malaysia	16
Medicine	16
United States	16
Decision making	14
Male	14
Patient satisfaction	13

characteristics in distinguishing and understanding the phenomenon of "Medical tourism". While the second strand, has been divided into two blocks. The aim is on one side to analyze the relationship between hospitals, market and business related to "Medical tourism" and on the other side to associate it with service provided characteristics such as the quality of service, the

aptitude for providing performance and the patient satisfaction (this last in particular in the United States). The analysis has been based on elements collected through questionnaires, psychological investigations, and some elements of econometrics. The sociological elements and characteristics of the analyzed sample have proved to be related to the elements of the second subgroup. The second cluster groups together criteria of market competitiveness linked to "medical tourism". In the second cluster, the use of information technology is divided into target subgroups of "medical tourism" and, therefore, to a series of specific aspects relating to tools, management trends, and distinct geographical areas. All studies have been conducted on Asia and Euroasia areas, which are particularly involved in "Medical Tourism". In the first subgroup it is possible to say that from an economic point of view, the Taiwanese market is considered a possible destination. Criteria to make a decisions are concerned both with medical characteristics and tourism market qualities and structures. The open comparison with Korea ones highlights relevant differences.

The hospital sector is then analyzed based on the geographical location and the existing health system features, the travel properties, and the associated elements. In China these elements were analyzed with questionnaires considering the tourism management theory. In Iran the hospital sector results to have been analyzed both on the basis of the perception of users linked to the health service received and on the basis of health tourism and tourism characteristics associated



Figure 3. Word TreeMap.



Figure 4. World cloud medical tourism.

with this kind of travel and choice. All previous analyzes have been reproduced in the most developed western countries. The comparison between western developed countries and Asian and Eurasian countries tries to identify the elements that push users to choose the Asian and Eurasian countries, the most used methods for the comparison are the qualitative analysis and the marketing elements adopted. Another subgroup of authors analyzes Asia and Europe considering: the number of hospitals available in the area, the accessibility through Internet of relevant information about the structures, and consequently the choices made “Medical tourism” by potential customers. These aspects have been analyzed considering: i) Malaysia tourist services explicitly offered in a one-to-one correspondence with tourism offer; ii) Thailand quality of the tourist services offered.

Figure 6 represents the “Medical tourism” topic trends over time. Between 2006 and 2010 the main themes were associated with “Medical tourism” from Europe toward Asia. Since 2010, attention has been given to a different relevant aspect which is the cost of health treatments in “Medical tourism”. Analysis can be found on this issue in 2012 by developed countries and the medical industry. From 2012 to 2014, new topics started to be studied which are specifically related to hospitality in the service: i) quality of healthcare services, ii) organization of hospitality, iii) global and international healthcare tourism flows and, finally, iv) the major destinations (including China). From 2014 to 2016, numerous topics related to “Medical tourism” were introduced, including: a) the outgrowth of people associated with the development of this specific kind of tourism, b) attention to women, and c) the analysis of new destinations related to

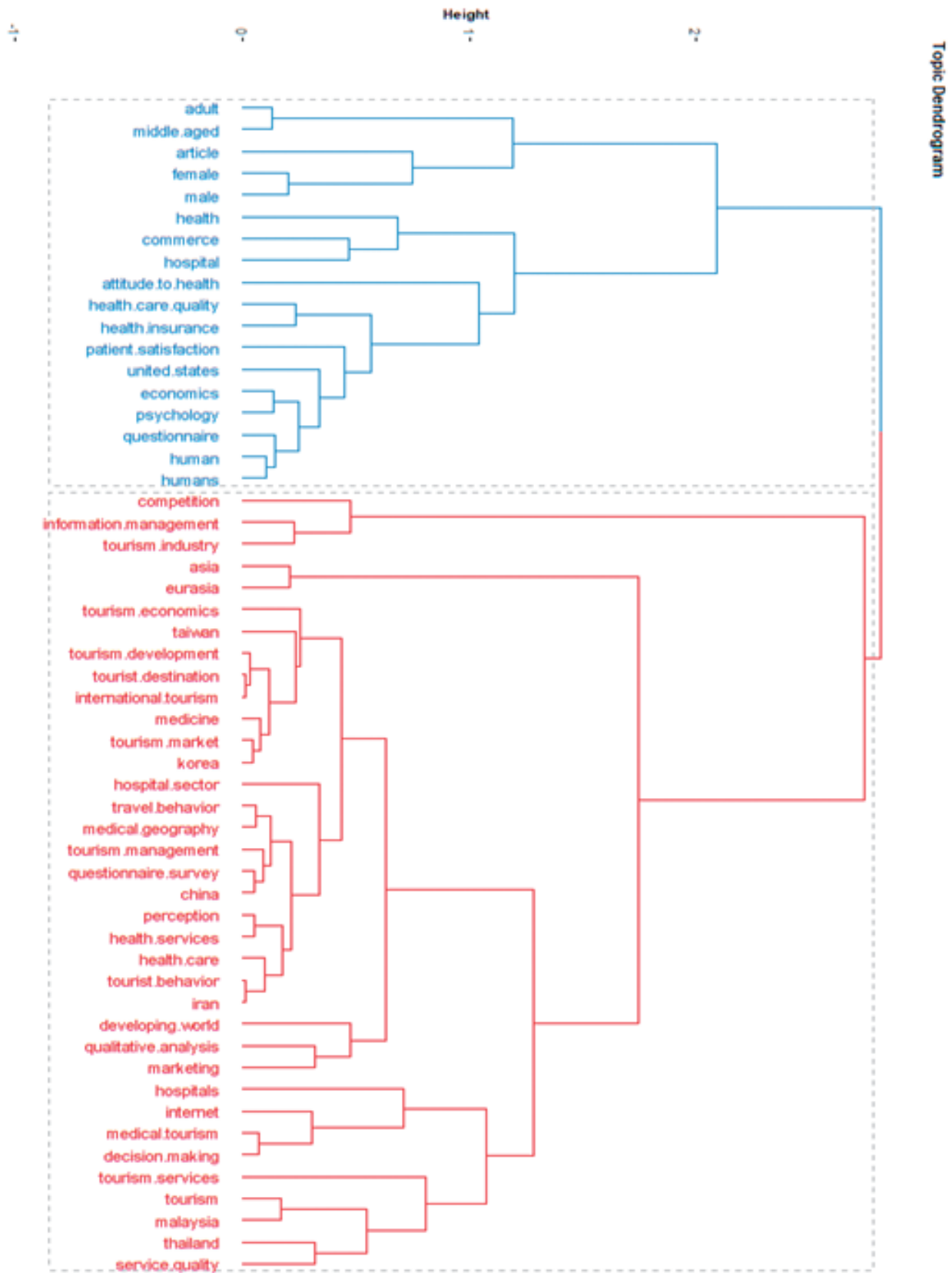


Figure 5. Topic dendrogram.



“Medical tourism” (including the United States and Malaysia). Finally, only since 2016, more considerable attention to management issues can be found. In particular authors take care of marketing associated with the “Medical tourism” market, of decision-making activities, and even of the introduction of tools for measuring and evaluating the phenomenon such as the use of questionnaires which can then be reworked with econometric

tools. In 2018 the focus is again on activities related to “Medical tourism” such as the analysis of online services offered for reservations, the total quality of the service, the use of quantitative tools for evaluating and measuring the phenomenon, and the management of connected tourism. In the same year a new destination – Iran – has been introduced with the consequence that many studies are focused on it.

**Table 6.** Articles that receive citations.

Ranking of authors (top 20)	Total citations (TC)	Average TC per year
Connell, J. (2006). “Medical tourism”: Sea, sun, sand and . . . surgery. <i>Tourism management</i> , 27(6), 1093–1100.	465	31
Allen, L. R., Long, P. T., Perdue, R. R., & Kieselbach, S. (1988). The impact of tourism development on residents’ perceptions of community life. <i>Journal of travel research</i> , 27(1), 16–21.	304	9,2121
Bookman, M. (2007). <i>Medical tourism in developing countries</i> . Springer.	244	17,4286
Connell, J. (2013). Contemporary “Medical tourism”: Conceptualisation, culture and commodification. <i>Tourism management</i> , 34, 1–13.	211	26,375
Han, H., & Hyun, S. S. (2015). Customer retention in the “Medical tourism” industry: Impact of quality, satisfaction, trust, and price reasonableness. <i>Tourism Management</i> , 46, 20–29.	143	23,8333
Stone, P. R. (2012). Dark tourism and significant other death: Towards a model of mortality mediation. <i>Annals of tourism research</i> , 39(3), 1565–1587.	136	15,1111
Yu, J. Y., & Ko, T. G. (2012). Japanese and Korean tourists in Korea. <i>Tourism management</i> , 33(1), 80–88.	119	13,2222
Connell, J. (2011). “Medical tourism”. Cabi.	109	10,9
Heung, V. C., Kucukusta, D., & Song, H. (2011). “Medical tourism” development in Hong Kong: An assessment of the barriers. <i>Tourism Management</i> , 32(5), 995–1005.	97	9,7
Hall, C. M., & James, M. (2011). “Medical tourism”: emerging biosecurity and nosocomial issues. <i>Tourism Review</i> .	97	9,7
Heung, V. C., Kucukusta, D., & Song, H. (2010). A conceptual model of “Medical tourism”: Implications for future research. <i>Journal of Travel &amp; Tourism Marketing</i> , 27(3), 236–251.	97	8,8182
Goodrich, J. N., & Goodrich, G. E. (1987). Health-care tourism—an exploratory study. <i>Tourism Management</i> , 8(3), 217–222.	97	2,8529
Smith, M., & Puczkó, L. (2008). <i>Health and wellness tourism</i> . Routledge.	96	7,3846
Erfurt-Cooper, P., & Cooper, M. (2009). <i>Health and wellness tourism: Spas and hot springs</i> . Channel View Publications.	94	7,8333
Cormany, D., & Baloglu, S. (2011). Medical travel facilitator websites: An exploratory study of web page contents and services offered to the prospective medical tourist. <i>Tourism management</i> , 32(4), 709–716.	76	7,6
Yeoh, E., Othman, K., & Ahmad, H. (2013). Understanding medical tourists: Word-of-mouth and viral marketing as potent marketing tools. <i>Tourism Management</i> , 34, 196–201.	69	8,625
Uriely, N., & Belhassen, Y. (2006). Drugs and risk-taking in tourism. <i>Annals of Tourism Research</i> , 33(2), 339–359.	69	4,6
Han, H., & Hwang, J. (2013). Multi-dimensions of the perceived benefits in a medical hotel and their roles in international travelers’ decision-making process. <i>International Journal of Hospitality Management</i> , 35, 100–108.	61	7,625
Abubakar, A. M., & Ilkan, M. (2016). Impact of online WOM on destination trust and intention to travel: A “Medical tourism” perspective. <i>Journal of Destination Marketing &amp; Management</i> , 5(3), 192–201.	59	11,8
Ye, B. H., Qiu, H. Z., & Yuen, P. P. (2011). Motivations and experiences of Mainland Chinese medical tourists in Hong Kong. <i>Tourism Management</i> , 32(5), 1125–1127.	55	5,5

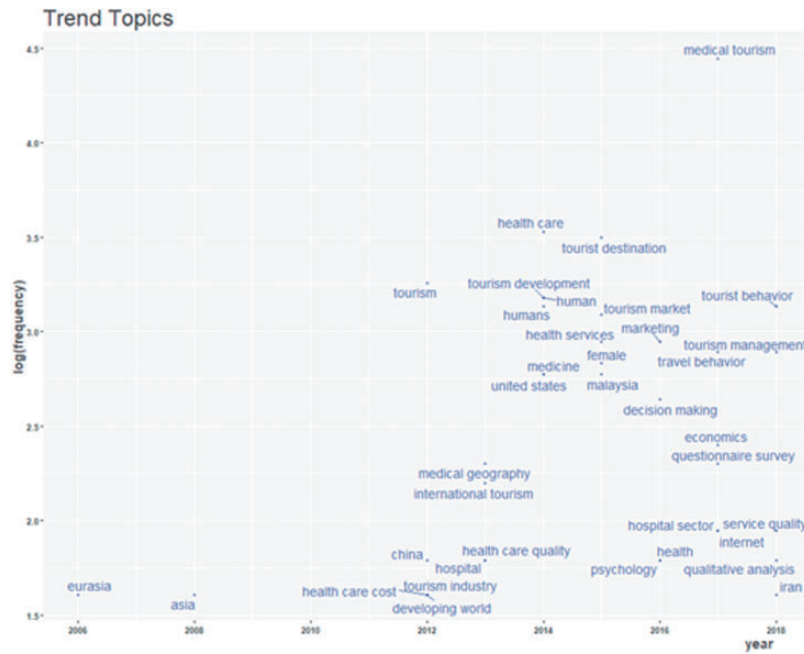


Figure 6. Trend topics.

### Total citations

Table 6 represents the number of citations in articles placed within the top 20 rankings. It shows that some items were cited only in specific years only. Several authors combine tourism management with other areas. This greatly influences the number of citations, especially when Tourism results linked to concepts such as *market* or *cost and providing of healthcare services*. The first referenced article is the one written by Connell in 20,062 which receives the highest number of citations for each year to date. Four articles – one again written by Connell in 20,131 another published in 2015,<sup>90</sup> a book dated 2007<sup>91</sup> and an article from 2012<sup>92</sup> – came out remarkably significant for the number of citations received in several years and considering the ranking obtained. This indicates that the papers can be considered material and provide clues, definitions and meanings of “Medical tourism” research field which have been shared by the community. According to the results, *Tourism Management* is the journal most cited with the presence of nine articles. Another journal *Annals of Tourism Research* resulted relevant too as it resulted cited twice. The first one focuses mainly on management, including planning, travel and tourism and proposes an interdisciplinary approach as it includes some issues related to planning and policy aspects at an international, national and regional level. It includes research articles, discussion of current issues, case studies and book reviews realized by academics and practitioners. The second one on the contrary focuses on tourism social

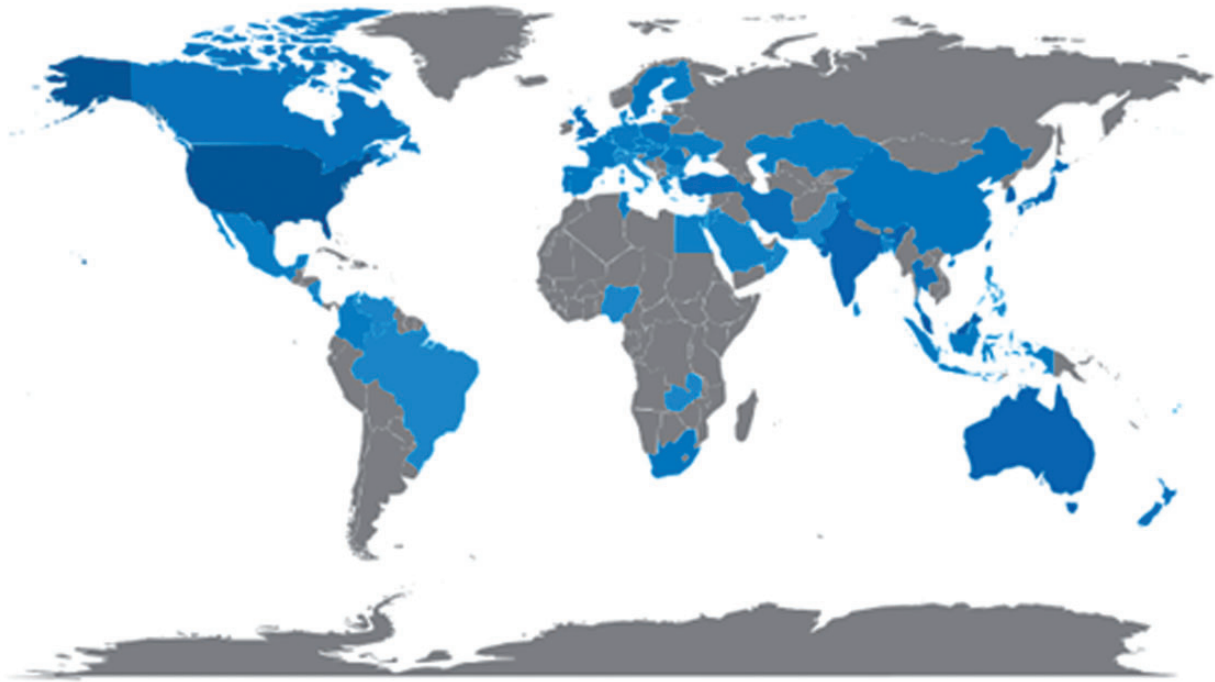
science with an academic approach. Although the theme of “medical tourism” is interdisciplinary, the topics and contents are oriented towards tourism.

### Country

This section analyses the geographical development of publishing about “Medical tourism” topic. Attention has been given to countries where publications were recovered and the number of published articles, the total number of citations and the setting of scientific networks have been taken into account. The following subsection starts from the analysis of the total number of published articles.

*Country total of articles.* Figure 7 and Table 7 display the countries where the “Medical tourism” theme has been studied. First place goes to USA (147). As already highlighted by several articles, USA is the nation most affected by the phenomenon as the number of residents moving towards less developed countries where the cost of treatment is pretty lower with the same or similar quality levels is considerable. Second and third place for Malaysia (70) and South Korea (55), Nations where the development and diffusion of hospitality structures related to health tourism have recently started to develop faster than elsewhere. This is why local government are interested in the issue and a number of researchers study the phenomenon highlighting characteristics with direct impact on the territory. Other nations follow in the general ranking. Here “Medical

# Country Scientific Production



**Figure 7.** Country's production.

**Table 7.** Total of articles in the country.

Region	Freq
USA	147
MALAYSIA	70
SOUTH KOREA	55
AUSTRALIA	49
INDIA	47
TAIWAN	39
JAPAN	35
UK	33
TURKEY	22
NEW ZEALAND	16
THAILAND	16
IRAN	15
CANADA	14
HUNGARY	12
POLAND	12
PORTUGAL	11
CHINA	9
ROMANIA	9
NETHERLANDS	8
FRANCE	7

*tourism*” topic is developing but at a slower pace. They are: Australia (49), India (47), Taiwan (39), Japan (35). Among them in an unexpected way a special role results to be played by a centre of excellence identifiable in the Australia’s Sunshine Coast.<sup>93–95</sup> Results also highlights the presence of numerous studies dedicated to the accreditation processes of health structures. In particular researchers have focused on investigating the International American and Canadian Joint Commission (IJC) work over Asian and Eurasian countries health structures. The IJC aims to guarantee the quality of the care received and facilitate health insurance coverage by different nations.<sup>96–100</sup>

*Country publications and collaboration map.* This section discusses articles on “*Medical tourism*” considering single or multiple publications in each country. It also aims to observe cooperation and networking among researchers working in different countries and studying the topic.

Table 8 highlights the average number of citations by state. USA, Australia and Korea place again themselves in the first places. However, a number of significant citations is also registered in United Kingdom, Israel,

**Table 8.** Country with a total of citations.

Country	Total citations	Average article citations
USA	988	23,524
AUSTRALIA	901	64,357
KOREA	564	20,143
UNITED KINGDOM	393	30,231
MALAYSIA	262	12,476
HONG KONG	158	31,6
TAIWAN	153	15,3
HUNGARY	131	21,833
NEW ZEALAND	128	25,6
CHINA	117	29,25
ISRAEL	108	36
NETHERLANDS	69	23
INDIA	66	6,6
CYPRUS	62	31
IRAN	38	19
CANADA	35	7
THAILAND	35	5
CROATIA	31	7,75
FRANCE	27	13,5
PORTUGAL	27	9

Cyprus, China, New Zealand. Countries are affected by the Phenomena for various reasons: i) on one hand some of them are now starting to compete to develop some kind of “*Medical tourism*”; ii) on the other hand some country have already developed virtuous circles which

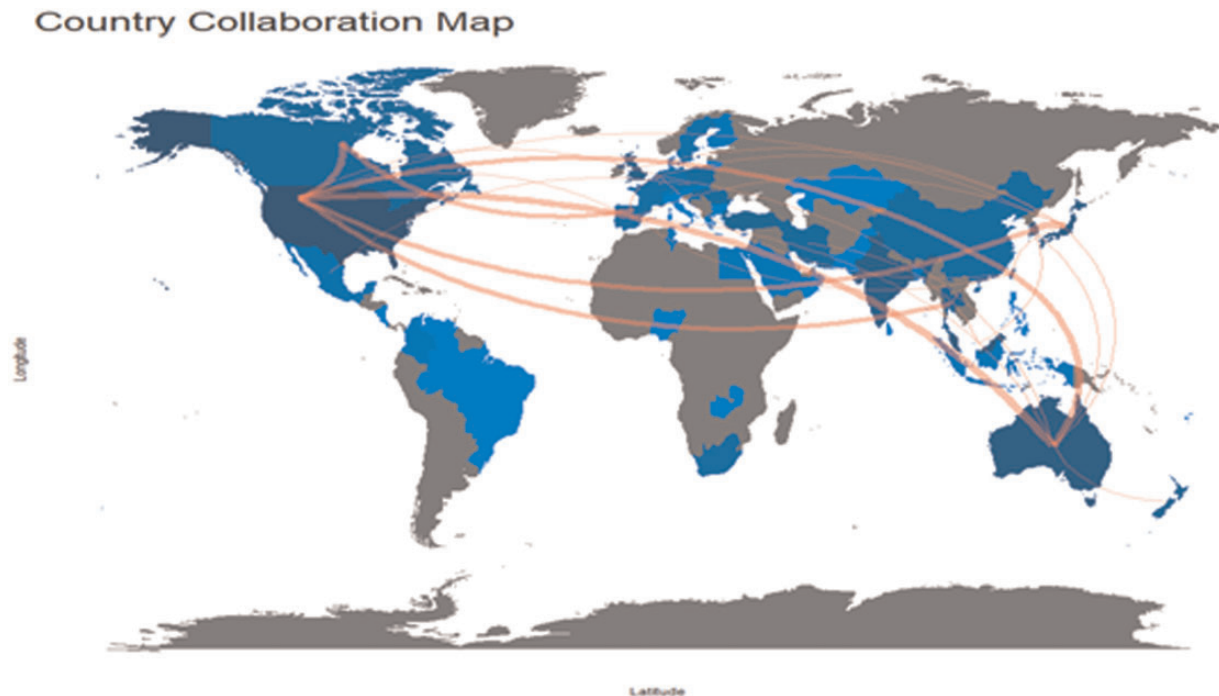
have allowed the growth of “*Medical tourism*”; iii) finally some other country, as already pointed out considering USA situation, because they suffer from it due to a high percentage of residents adopting the “*travel for health care*” pattern of behavior.

Figure 8 shows the cooperation path in the world: the blue colour on the map represents the existence of research networks with other nations. It is interesting to notice that the countries with a major number of publications on “*Medical tourism*” are the one with higher partnership rates meaning that they have shared information and helped each other to find scientific relevant results. USA, Japan, Malaysia, and Australia are the countries that were found to have the most significant networking rates with other countries which are sometimes very far away from each other and which were shown to be conditioned by policies and practices related to healthcare mobility.

## Discussion and conclusion

This bibliometric analysis had as main research question to try and establish the studies trend in terms of authors, citations, journals and also topics.

The research shows that four are the authors with the highest number of publications about the topic here considered (3): Demicco Fj, Connell J, Han H. All their contributions are focused on the analysis of “*Medical tourism*” with different focus: i) Demicco examines guest services, management, and leadership principles,

**Figure 8.** Country's collaboration map.

therefore focusing on tourist and hotel services associated with healthcare; ii) Connell focuses mainly on the sociological characteristics of people choosing to take part in “*Medical tourism*”, analyzing related parameters such as the use of information obtained from the internet, marketing variables and elements that guide the choice; iii) finally, Han focuses on outcomes and “*Medical tourism*” models.

In terms of dominance ranking, the essential author is Connell J., who is professor at the University of Sydney and has been a consultant to both the Department of Primary Industry and the Department of Mines and Energy in Papua New Guinea. He worked with the South Pacific Commission, the World Health Organisation and the International Labour Organisation on long-term projects on migration and employment in the South Pacific region.

The analysis finds out that the journals most involved in the research area are *Tourism management* with nine top ranking publications and *Annals of Tourism Research*. Table 6 highlights the most cited articles on the topic and the related journals on which the articles have been published. *Tourism management* is the journal on which there are more articles on medical tourism and more articles cited. Contrary to the *Annals of Tourism Research*, which presents more citations concerning the low number (4) of articles identified by the bibliometric analysis. Table 2 and (Graph 2) highlight the multidisciplinary nature of the theme. The journals that develop and deepen the theme of medical tourism are oriented or on the medical and treatment aspects or on the the medical journey’s destination accessory elements. Destination and care are conglomerate themes in “*Medical Tourism*” therefore the main articles on the subject are very often allocated in journal more oriented to one or the other theme, except for the two specialized journals *Current Issues and Emerging Trends in Medical Tourism* and *Medical Tourism and Wellness: Hospitality Bridging Healthcare (H2h)*.

Regarding citations analysis, the *holistic approach* of Connell<sup>2</sup> has resulted to be the article that received the most citations. From the keywords used, the business models adopted for “*Medical tourism*” are declined considering the areas: organization, marketing, organization of health services and travel and decision-making activities. This evidence further demonstrates the broad approach of this research area to multidisciplinary and business themes.

Moreover, the topic dendrogram (*Graph 3*) describes two evolutions of the discussion. The first grouping considers innovative aspects socio-demographic characteristics. The second represents an area of research of management elements of tourism and healthcare services exploring the regions of Asia and Euroasia. From 2006 to today, the topic highlighted in (*Figure 6*) outlines an

evolution of the emerging issue linked to hospitality in service (quality of health services, organization of hospitality, world and international tourist flows of health tourism and main destinations). Between 2014 and 2016, numerous issues are developed. The main ones concern developing skills related to the development of this specific type of tourism (attention to women and the analysis of new destinations among which the Malaysian offer emerges). The analyses are currently focused on management, decision-making, and market issues related to “*Medical Tourism*”.

Several European countries have been ranked among the first according to the Bloomberg Health-Care Efficiency ranking (These Are the Economies With the Most – and Least – Efficient Health Care 2018) which is based on data taken from the World Bank, WHO, United Nations and IMF.<sup>101</sup> They were found to be the most efficient health systems in the world by analyzing the relationship between costs and life expectancy. This is why it is amazing to find out that there are not many studies on “*Medical tourism*” in Europe.<sup>28,102,103</sup> More in the detail a sole article can be found that indicates the reasons related to the choices of destination based on the possible medical treatments in Europe.<sup>104</sup> No comparative analysis between different European health system output and outcome, nor case studies describing European excellence have been published up to now. No case studies or comparisons in terms of business and management were carried out among European states and Asian and Eurasian countries attracting greater flows of “*Medical tourism*”. Only a few comparisons in terms of cost-effectiveness can be picked out from previous reviews of the literature,<sup>22</sup> but there are no ongoing official collections or periodic comparisons between European countries and significant “*Medical tourism*” destinations.

Some interesting articles consider the intrinsic characteristics of the structures highlighted by the *Joint Commission International (JCI)* as a standard that can guide the analysis and comparison between structures between western countries and the main “*Medical tourism*” destinations. No analysis of the financial statements of virtuous structures specifically dedicated to “*Medical tourism*” and costs related to health services in Europe can be found in literature. They resulted among the topics to be developed in a few studies written almost ten years ago,<sup>19,20</sup> but never after considered as researchers didn’t develop any completion on the phenomenon. Unfortunately, systems commonly used to manage these special kinds of services and travel is private and this represents an important current limit to get access to data. This could be considered a reason for the lack of research on the topic.

Therefore, it seems that the theme of management of the phenomena, of consumer decision-making, of

marketing and organizational issues, of accounting needs to be developed.

Finally, the introduction of the Directive 2011/24/EU (Direttiva 2011/24/UE) entitled “*Patients’ rights in cross-border healthcare*”<sup>105</sup> has not yet been analysed from a business point of view, but only to point out structural and organizational differences in health care between certain countries.<sup>106</sup>

This bibliometric analysis helps to point out that the phenomenon of “Medical tourism”, the absence of publications on the European area presents a significant gap in the literature, which requires further investigation in light of the European output legislation, which recognizes mobility within the area. The analyses conducted on “Medial Tourism” in Asian countries and the relationship between the USA and destinations accredited by the Joint Commission require in-depth analysis and extensions of the European area’s empirical research.

Healthcare managers and entrepreneurs in European countries could develop and communicate better the opportunities and destinations offered that are not fully developed despite the high ranking of care. In particular, destinations already selected by European tourists could be favored through the study of current flows or create new local opportunities. However, these policies can be further increased by public policies to the advantage of this emerging sector. The analysis of the current OECD and European Community databases does not guarantee an accurate analysis of medical tourism flows in the European context.

The systematic and bibliometric analysis of the literature on COVID-19<sup>107</sup> highlights limitations related to the mobility and use of hotels by providing new approaches in the tourism field, but the topic of medical tourism remains unexplored and requires more in-depth analysis based on the results of the study carried out. Trends, results and literature will be updated based on the progress of the pandemic and will be conditioned by the public health choices of each state.

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