

The main paths of medical tourism: From transplantation to beautification



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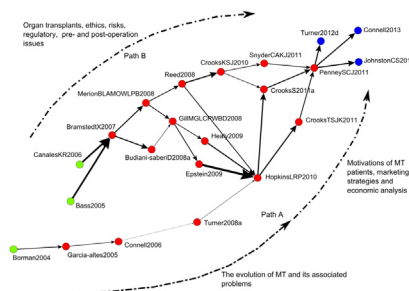
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HIGHLIGHTS

- We collect and analyze 392 medical tourism related academic papers.
- The main path analysis reveals two major medical tourism research streams.
- Ethics and risks related to organ transplantation are largely discussed.
- Economic and marketing issues need more discussion.
- Beautification appears to be the potential growing segment.

GRAPHICAL ABSTRACT



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ABSTRACT

Medical tourism, combining the very polarized purposes of pleasurable travel and potentially stressful health care services, is an emergent and growing business worldwide. Medical tourism patients are willing to travel abroad to seek better quality, lower cost, domestically unavailable, no wait-time destinations for non-emergency medical care. There are numerous related studies in the academic literature that are substantiated with multidisciplinary and diverse backgrounds. This study uses the main path analysis, a unique quantitative and citation-based approach, to analyze the significant development trajectories, important literature, and recent active research areas in medical tourism. We find that there are two distinctive development paths: one path focuses more on the evolution of medical tourism, the motivation factors, marketing strategies, and economic analysis; the other path emphasizes organ transplant and related issues. These two paths eventually merge to a common node in the citation network, which foretells transplantation to beautification as the future research direction trend.

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1. Introduction

Medical tourists are patients who travel internationally for non-urgent medical treatments like organ transplants, stem cell

treatments, reproductive services, cosmetic surgery, and dental care, etc. High costs, lack of insurance, under-insured, long waiting-times, and domestically unavailable treatments are some of the causes to go abroad to seek medical services (Borman, 2004). There are also locally illegible or prohibited treatments, some which are considered as experimental treatments that can be found from offshore sources. Increasing globalization, intensifying competition, and advancing transportation, communication, and information technologies have

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also been responsible for the phenomenal growth of cross border health care services.

As a manifestation of globalization and privatization, the MT industry has grown in recent years especially in Asian countries like India, Thailand, Singapore, and Malaysia. High velocity growth has also shown up in countries like the United States, Canada, Brazil, South Africa, Indonesia, Mexico, Cuba, and the Philippines (Crooks, Kingsbury, Snyder, & Johnston, 2010). One of the major drivers for MT's fast growth is fueled by the rising costs of medical treatment. For example, the rising costs of medical treatment in the United States are pushing the movement to outsource medical treatment. As a comparison, charges for common procedures such as a heart bypass can be 12:1 between the United States and Thailand, or 3:1 between the United States and Singapore for knee replacement (Turner, 2012b).

Several papers (Connell, 2006, 2013; Crooks et al., 2010; Hopkins, Labonte, Runnels, & Packer, 2010) have been published in an attempt to summarize the current literature related to the MT industry. Connell (2006) examined many medical tourism-related studies in the literature to evaluate the magnitude, the longevity, the growth, and the trend of the industry, indicating that MT is likely to increase even faster in the future as many countries are vying to enter the vibrant market while several Asian countries are dominant in the industry and have created new dimensions of the globalization of MT. Crooks et al. (2010) reviewed patients' experience of MT from a set of published academic articles, media sources, and gray literature reports. The study summarizes the critical issues and development trends from both a cross sectional view and longitudinal aspect. Hopkins et al. (2010) undertook a systematic approach by collecting and reading MT-related papers from PubMed, Scopus, CINAHL, and CAB HEALTH databases, as well as Internet search engines to determine how MT might affect health equity within and between nations participating in this trade. Connell (2013) indicated that much of the medical tourism is short distance and diasporic, despite being part of an increasingly global medical industry. Quality and availability of care are key influences on medical tourism behavior, alongside economic and cultural factors.

Despite the numerous scholarly attempts to identify, understand, and elaborate upon the nature and the associated issues related to the MT industry, this body of research could be described as heterogeneous (examining this industry from diverse risks, ethics, economics, marketing, and other perspectives) and fragmented (covering only a few specific dimensions of cross border patient, agent, health care professionals', and legislators' interactions). This article attempts to fill this gap by using a systematic approach that simultaneously captures the associations among the key issues and concerns and to deliver a comprehensive scope and the extent of the MT industry.

The novelty of our study lies in methodological and systematic grounds. Methodologically, we adopt a "main path" approach that delivers the longitudinal development trajectory of the MT field. The main path method has been applied successfully to review the development of several technological and academic fields (Chen, Liu, & Lin, 2013; Colicchia & Strozzi, 2012; David, Fernando, & Itziar, 2011; Liu, Lu, Lu, & Lin, 2013a, 2013b; Lu, Lin, Liu, & Yu, 2012; Lu & Liu, 2013; Martinelli, 2012; Verspagen, 2007). To the best of our knowledge, the main path method has not been used in the areas of tourism studies. Systematically, we sort out the taxonomy of the major topics that are of greater concerns at each specific time frame that have been critical to the success of MT development. We also identify the shift of the emphases of the industry both in terms of the critical issues and the direction of future business expansion.

Apparently, the critical issues of MT are dynamic and layered, as the direction of the MT industry development is multifaceted. A

structured literature review with underpinning taxonomy should add value to the industry. The main path analysis can help identify the mainstream literature and the related main themes, which imply potential future research trends. Specifically, the emergent literature in current burgeoning areas can help detect the potential future growing business in the MT industry. Many critical concerns and unresolved issues can be identified to help improve the overall quality of the industry. Moreover, the motivation factors of the MT patients, key marketing decision processes, and the direction of business expansion may be recognized. Business managers in related industries can therefore allocate resources and accordingly direct their attention.

The remainder of this article is formatted as follows. First, we present the main path method used in the study. Second, we review the extant research on MT and elaborate upon the nature of its development. Third, we conduct the main path analysis to formulate the associations and trajectories of the literature selected on the main path. Fourth, we analyze and discuss the findings referring to each of the research trajectories. Fifth, we derive conclusions and present directions for further research.

2. Methodology

2.1. Main path analysis

We apply the main path method to map the major development of MT. Hummon and Doreian (1989) first introduced the method that used citation information to trace the main ideas that flow in a scientific discipline. This is based on the assumption that when a new publication cites a previous work, knowledge flows from the previous work to the citing publication. The method is network-based, where the scientific publications are seen as nodes of a network, and citation information links knowledge flows among nodes. The citation network thus created is a non-weighted directed network.

Tracing the flow of ideas in a small citation network may be easy, but the same task done for a large network is not trivial. Hummon and Doreian (1989) suggested a way to simplify the task in a large citation network: tracing only the 'main path'. The method he presented is divided into two steps. The first step identifies the importance of each citation link in the network according to its position in the network structure. The second step searches in the network for the most significant path(s) based on the importance of the citation link obtained in the first step. They applied the method to trace a small set of DNA papers. The papers on the main path were identified as being the most important papers by other researchers who applied a completely different methodology.

The importance of each citation is measured by counting the number of times a citation link has been traversed if one exhausts the search from a set of starting nodes to another set of ending nodes. There are several algorithms to conduct the count. The literature mentions node pair projection count (NPPC), search path link count (SPLC), search path nodes pair (SPNP), and search path count (SPC) (Batagelj, 2003; Hummon & Doreian, 1989). These counts are similar, but subtle differences exist among them. Many previous studies indicated that these algorithms produce similar results (Batagelj, 2003; Martinelli, 2012; Verspagen, 2007). Our pilot study applies SPC, SPLC, and SPNP algorithms to medical tourism data and finds that they produce almost exactly the same results except that the SPC algorithm includes an additional node. In light of (Batagelj, 2003) suggesting using SPC as the first choice, we present and discuss our results based on the SPC algorithm.

We use the example network in Fig. 1 to explain how SPCs for each citation link are calculated. In a citation network, a 'source' is a node that is cited, but cites no other nodes; a 'sink' is a node that

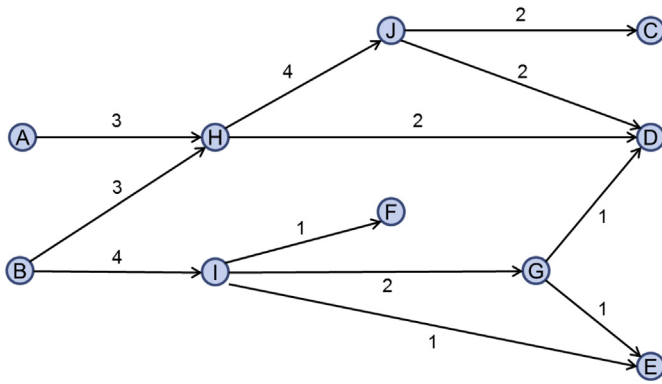


Fig. 1. Example network.

cites other nodes, but is not cited; an ‘intermediate’ node not only cites but is also cited by other nodes. In other words, sources are the origins of knowledge, while sinks are the end points of knowledge dissemination. The example network has two sources, A and B, and four sinks, C, D, E, and F. In general, there are many alternative paths to go from a source to a sink.

Assuming that one searches for all paths from all the sources to all the sinks, then SPC for a link is defined as the total number of times the link is traversed. For example, link J–C has SPC value of 2, because it is passed through by paths A–H–J–C and B–H–J–C. Link B–I’s SPC value is 4 as it is traversed by four paths: B–I–F, B–I–G–D, B–I–G–E, and B–I–E. The SPC value for each link is indicated in Fig. 1. In this network, B–I and H–J have the largest SPC value. The method assumes that the larger the SPC value is, the more important the link’s role is in transmitting the knowledge.

After the SPC value for each citation link is calculated, one begins the key-route search procedure by selecting a key-route; it is usually a link that has a very high traversal count. One then searches forward from the end node of this key-route until a sink is hit and searches backward from the start node of the key-route until a source is hit. Piecing together the backward search results, the key-route itself, and the forward searching results, one obtains the key-route main path (Liu & Lu, 2012). Upon selecting more than one key-route, one obtains a multiple key-route paths. The key-route search procedure guarantees the inclusion of the specified key-routes. Best of all, one can control the level of details in the main paths by specifying different numbers of key-routes. Fig. 2 shows the key-route main paths for the example citation network. They are based on the top 2 most significant links, B–I and H–J.

2.2. Growth curve analysis

Growth curve analysis is commonly used to analyze a set of time series data in order to comprehend the growth trend of the data. Here, we assume that the growth of the scientific literature follows an S-shaped curve, which predicts that the size of the literature will reach its peak and stop growing after a period of time. A typical S-shaped curve increases a little slowly in the beginning and speeds up exponentially at a certain point. After passing the ‘midpoint’ (where the growth rate inflects), the growth slows down and eventually reaches a growth limit. The growth curve analysis fits the given time series data with the logistic function of the following form:

$$S(t) = \frac{\kappa}{1 + \exp\left[-\frac{\ln(81)}{\Delta t}(t - t_m)\right]}, \quad (1)$$

where κ is the growth limit; t_m is the midpoint of the growth trajectory; and Δt , the life cycle, is defined as the time the development takes to grow from 10% to 90% of the growth limit.

We conduct the growth curve analysis using the Loglet Lab software (Yung, Meyer, & Ausubel, 1999). Given the yearly accumulated number of papers, the software analyzes the data and provides the growth limit, the midpoint, and the life cycle of a best-fit S-shaped curve.

2.3. Data

The authors collect academic articles and associated citation information from the Web of Science (WOS) citation database, including Social Sciences Citation Index (SSCI), Conference Proceedings Index-Science (CPI-S), and Conference Proceedings Index-Social Science and Humanities (CPI-SSH), provided by Thomson Reuters.¹ We search the database with a query string² that contains a set of predefined keywords that are combinations of two sets of words or phrases. The first set includes medical, health, transplant, stem cell, cosmetic, and surgical. The second set includes tourism and travel. Papers that contain any of these keywords in the title, abstract, author keyword, or Keywords Plus[®] fields are retrieved from the database. The query to the database in January 2013 results in a total of 392 papers.³ These 392 papers are the basis for this study. We then find again from the WOS database the citation information for each of these papers. The citation information helps link these papers into a citation network.

3. Analysis

3.1. Growth trend of MT papers

As mentioned earlier, MT has attracted the attention of many scholars in recent years. To summarize its current development status and predict its future growth, we conduct a growth curve analysis using the Loglet Lab software (Yung et al., 1999). We exclude 2012 data for this analysis as our data have been collected in January 2013, and the database may not have included all of the 2012 papers at that time.

Fig. 3 displays the results of the growth analysis. The figure’s upper-left corner lists the estimates of the growth limit, the midpoint, and the life cycle. The two numbers in the parenthesis are the results at the 90% confidence interval for each characteristic. There are only a few papers elaborating upon the subject of MT each year before 2005. Afterwards, the number of paper published annually exceeded 10 and increased quickly to reach an all-time high of 85 in 2010. Paper growth is expected to reach its midpoint in 2013 and saturate around 2018 (2013 + 9.5/2). At that time, the number of papers is predicted to be around 1247. This

¹ Medical tourism articles are also available in other major academic databases such as PubMed, Scopus, and Google Scholar. Each of the databases has their strengths and weaknesses (Falagas, Pitsouni, Malietzis, & Pappas, 2008). Due to time and financial constraints, the authors did not take the approach of searching medical tourism articles in all of the above databases. Readers should take this limitation into consideration in interpreting the results of this study.

² TS = (“medical tourism*” OR “medical travel*” OR “health tourism*” OR “health travel*” OR “transplant tourism*” OR “transplant travel*” OR “stem cell tourism*” OR “stem cell travel*” OR “cosmet* tourism*” OR “cosmet* travel*” OR “surgical tourism*” OR “surgical travel*” OR “dent* tourism*” OR “dent* travel*”).

³ These papers are published in a variety of journals. We examined 24 journals that have published more than four MT papers, and the top three journals are the American Journal of Transplantation, American Journal of Bioethics, and Tourism Management. Among all, 20 are medical- or health-related journals, with the 4 exceptions being Tourism Management, Signs, Journal of Travel & Tourism Marketing, and Annals of Tourism Research. In addition, only 6.1% of papers (24 out of 392) are published in tourism-related journals. It is obvious that this set of literature is heavily biased towards medical or health viewpoints and certainly leaves a lot of room for tourism researchers to voice their own perspectives in future research.

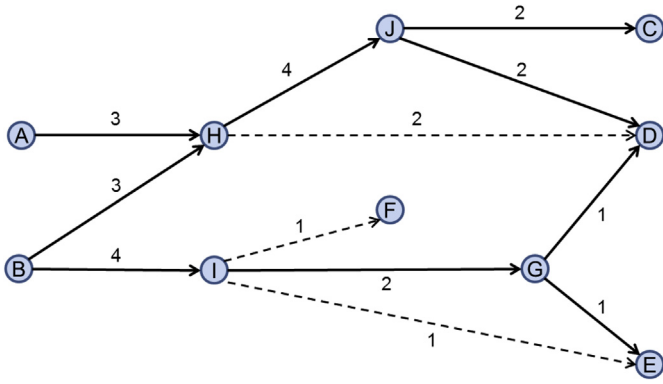


Fig. 2. Key-route main paths of the example network.

highlights the great potential for paper growth on the subject of MT.

We would like to point out that predicting the future through growth curve analysis is an extrapolation of the historical data. We apply the analysis only to provide a point of reference, but not to predict the exact future.

3.2. Classification of the focused issues

What are the focuses of papers in this collection of the MT literature? An efficient approach to obtain the information is through examining the paper titles as they usually highlight the emphasis of the papers. The authors examine the titles of all 392 MT papers and find that, in addition to general terms such as ‘health’, ‘health care’, and ‘healthcare’, these titles consist of many specific health-related terms, including ‘transplant’, ‘stem cell’, ‘surgery’, ‘organ trafficking’, ‘kidney’, ‘dental’, ‘cosmetic’, etc. Furthermore, terms such as ‘ethical’, ‘ethics’, ‘risk’, ‘trade’, ‘market’, ‘policy’, ‘social’, ‘society’, etc. are also spread around in these titles. The authors therefore address the above question from two perspectives: the concerned health issues and the discussed socioeconomic issues. The concerned health issues are further divided into several groups that consist of transplantation, stem cell, reproductive, cosmetic surgery (plastic, reconstructive, and aesthetic surgery), gender reassignment, radiotherapy, climatotherapy, and general, in which the general group indicates that the

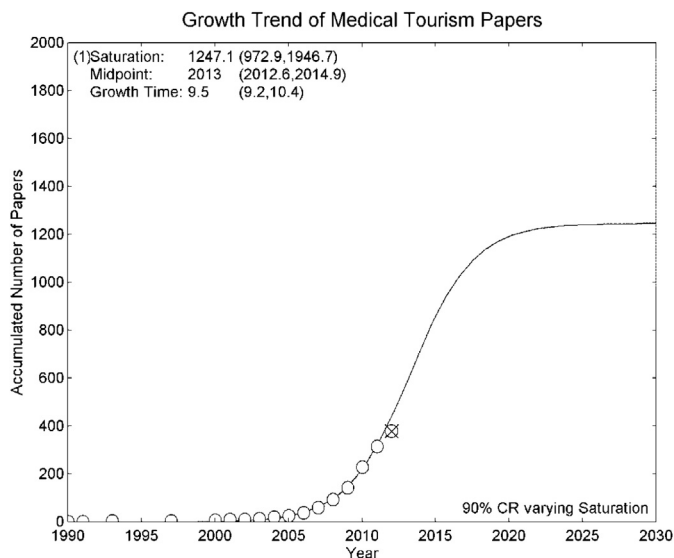


Fig. 3. Medical tourism paper growth.

papers in that group do not focus on specific health issues. The discussed socioeconomic issues are divided into ethics, risks (travel-related diseases, quality of procedures, post-operative insurance), economics (trade balance, equity, MT growth potential), health policy (health policy and services, international relations, law), marketing (promotion channel, market analysis), and review, in which the review type designates that the paper is a survey or review in nature. One of this paper’s co-authors manually examined these papers one by one and has classified each paper under both perspectives. Table 1 presents the proportions of the number of papers found in each group among all 392 papers.

A little more than half of the papers (52.04%) offer a general discussion and do not focus on specific health issues. For those that do, around one quarter (26.53%) centers on organ transplantation. In the organ transplantation studies, the main concern is ethics, followed by risks. From the socioeconomic perspective as a whole, ethics and risks together take up around 50% of the discussion, followed by economics, health policy, and marketing discussions. We thus observe the fact that ethics and risks issues related to organ transplantation are the most discussed subject in the MT field up to the present day. Nevertheless, there is no lack of papers that focus on economics and marketing issues. General discussions on economics and marketing issues, which are the main concern of the tourism industry, add up to one quarter of the total papers.

It looks like cosmetics and non-cosmetics papers grew in different direction after 2010. Table 2 lists the number of cosmetics and non-cosmetics papers by year from 2004 to 2011, where cosmetics refers to papers that focus on aesthetic, bariatric, and plastic surgery issues and non-cosmetics includes papers focusing on transplantation, reproductive, dental, and stem cell. Cosmetics papers, although occupying only a relatively small proportion (4.08%) of overall papers, increased abruptly from 1 to 5 in 2010. Papers elaborating upon non-cosmetics issues, on the other hand, seem to reach their plateau in 2010.

3.3. Main paths

Applying the key-route main path analysis at the top 20 routes results in identifying 22 MT papers on the main path. Table 3 presents the details of these papers. The linkage and the trajectory of these papers highlight MT’s development path, which is shown in Fig. 4. In the figure, arrows point from the cited papers to the citing papers. Links with larger SPC values are expressed by a thicker line. Three gray levels of nodes indicate sources, intermediates, and sinks, respectively.⁴ The label for each paper begins with the last name of the first author, continues with the first initials of the co-authors (in capital letters), and ends with its publishing year. It is evident that there are two distinctive development paths that started out with different themes. One of the paths is more focused on the evolution of MT and its associated problems, motivation factors of patients, marketing strategies, and economic analysis. The other path concentrates more on organ transplantation, ethics, risks, regulatory pre- and post-operation related issues. For the ease of discussion, these two paths are denoted as Path A and Path B. These two paths eventually merge to a common node in the network, which leads the trend of MT’s future development.

3.3.1. The evolution of MT and its associated problems, motivations of MT patients, marketing strategies, and economic analysis (Path A)

We start out with one of the paths that focus on the evolution of the MT industry and the associated issues. Along this path we find

⁴ Nodes are presented in color in the digital version in which green, red, and blue nodes indicate sources, intermediates, and sinks, respectively.

Table 1
Summary of issues discussed in MT-related papers (392 papers in total).

Health	Socioeconomic						Total
	Ethics	Risks	Economic	Health policy	Marketing	General and reviews	
General	9.95	5.87	13.78	8.42	10.71	3.32	52.04
Organ transplantation	11.73	8.42	1.53	4.34	0.00	0.51	26.53
Stem cell	3.83	2.30	1.02	1.28	1.28		9.69
Cosmetics	1.28	1.28	0.26	0.26	1.02		4.08
Reproductive	1.79	0.51	0.00	1.28	0.51		4.08
Dental	0.77	1.28	0.26			0.51	2.81
Climatotherapy			0.26				0.26
Gender reassignment					0.26		0.26
Radiotherapy			0.26				0.26
Total	29.34	19.64	17.35	15.56	13.78	4.34	100.00

Note: All numbers are in percentage of the total 392 papers.

that roughly before 2010, most of the papers discuss organ transplant technology related risk and ethics-related issues. Papers published after 2010 focus more on economics, health policy, and marketing issues. Apparently, as MT is evolving, the quality of the service has improved. In parallel with the fast growth of the MT sector, more economics- and marketing-related issues have emerged, which deserve more attention.

The path begins with the paper Borman2004 (Borman, 2004), as shown in Fig. 4, which suggests that many ethics-related problems encountered in the development of the MT industry must be addressed by holding accountable all participants, including clinicians, agents, or managers in the industry. The primacy of patient needs, confidentiality, and trust between doctors and their patients are the key elements to maintain a good patient–doctor relationship. These are not only required by regulatory governance, but also bounded by ethical codes. As to MT business agents, they must maintain a good balance between the potential responsibilities of being employees and their ethical responsibilities to their customers. Good governance, which underpins ethical, clinical, and humanitarian grounds for the MT industry, is becoming increasingly important.

Many new phenomena and issues are proliferating as MT starts to enjoy accelerated growth globally. Attempts have been made, which are found in the papers along this path, to describe these sensations and to address the scope of their impact within social and economic environments. Garcia-altes2005 (Garcia-Altes, 2005) used MT in Malaysia as a case to exemplify that the industry can enjoy very rewarding outcomes if the government can envision the prospects of the business potential and act aggressively accordingly. Connell2006 (Connell, 2006) pointed out that the MT industry has expanded into many dimensions and created many niche markets, and increasingly there are more patients going to developing countries instead of developed countries. The burgeoning industry has shaped the accelerated globalization of both health care and tourism. Turner2008a (Turner, 2008) indicated that unregulated commercialization of the MT industry may promote underground economies in the sale of organs, which tarnish the image of MT and create many humanitarian-related problems. HopkinsLRP2010 (Hopkins et al., 2010) showed that, ironically, the resources that are diverted to support the MT industry help improve the prosperity, but impair the accessibility and the quality of the domestic people in many of the destination countries.

Table 2
Number of papers by year.

	2004	2005	2006	2007	2008	2009	2010	2011
Cosmetics				1	1	1	5	5
Non-cosmetics	1	1	3	7	22	35	41	33

There appears to be a diverting point on the path after 2010, when a growing number of literature begin to discuss marketing- and economic-related issues instead of ethics- or risk-related concerns. CrooksTSJK2011 (Crooks, Turner, Snyder, Johnston, & Kingsbury, 2011) analyzed a wide range of marketing materials to identify and understand the messages and images that companies use to market India as a global MT destination. The rapid growth of information technology also augments the growth of the MT industry, and many MT patients have made decisions based on the disclosed information in related websites. PenneySCJ2011 (Penney, Snyder, Crooks, & Johnston, 2011) examined seventeen websites and found that Canadian MT broker websites vary widely in scope, content, professionalism, and depth of information. Training and accreditation, risk communication, and business dimensions of the MT industry are the key areas that deserve major enhancements.

3.3.1.1. The implications and discussions from the main path analysis along Path A. We find many themes along the path, as the MT industry is growing where many unexpected issues and concerns emerge progressively. This path vividly describes the evolution and transformation of the MT industry. First, MT has demonstrated its prominence in the practical and conceptual domains of tourism. Several demographic, economic, lifestyle, technology, and government initiative factors are driving such tourism. Relatively affordable international travel, favorable economic exchange rates, the seamless integration of the medical and tourism industries, and the availability of pervasive Internet advertising power have all contributed to its rapid growth. Many closely knitted players, including government legislators, travel agents, hospital specialists, and Internet marketers, have all contributed to facilitate the multidisciplinary and cross-field integration and packaging of many specialized services, which has made the MT industry more convenient and reliable. This one-stop shopping product has attracted many new patients and tourists who had never traveled overseas before. The whole tourism infrastructure, including hotels, travel agencies, transportation, or even the communication sector, has benefited considerably from the new niche. In parallel, fitting the infrastructure of the health care into tourism also achieves advantages from this new market through diversification and transformation.

Second, the paradigm of the business practice has also changed, where the flow of patients has reversed, directing more to developing countries from developed countries. Many Asian countries, developing countries in Eastern Europe, and some countries in the Caribbean are recognized as medical tourism destinations, primarily because they have adopted many upgraded technologies, absorbed western medical practices, and emphasized low cost and prompt attention. Although there is a lack of information and data

Table 3
Papers on the MT main paths.

Codes	Authors	Title	Journal	Total citations
Borman2004	Borman (2004)	Health tourism – Where healthcare, ethics, and the state collide	British Medical Journal	13
Bass2005	Bass (2005)	Kidneys for cash and egg safaris – can we allow 'transplant tourism' to flourish in South Africa?	South African Medical Journal	7
Garcia-altes2005	Garcia-Altes (2005)	The development of health tourism services	Annals of Tourism Research	17
Connell2006	Connell (2006)	Medical tourism: Sea, sun, sand and... surgery	Tourism Management	71
CanalesKR2006	Canales et al. (2006)	Transplant tourism: Outcomes of United States residents who undergo kidney transplantation overseas	Transplantation	57
BramstedtX2007	Bramstedt and Xu (2007)	Checklist: Passport, plane ticket, organ transplant	American Journal of Transplantation	26
MerionBLAMOWLPB2008	Merion et al. (2008)	Transplants in foreign countries among patients removed from the US transplant waiting list	American Journal of Transplantation	30
Budiani-saberiD2008a	Budiani-Saberi and Delmonico (2008)	Organ trafficking and transplant tourism: A commentary on the global realities	American Journal of Transplantation	50
Turner2008a	Turner (2008)	'Medical tourism' initiatives should exclude commercial organ transplantation	Journal of The Royal Society of Medicine	8
GillMGLCPWBD2008	Gill et al. (2008)	Transplant tourism in the United States: A single-center experience	Clinical Journal of the American Society of Nephrology	28
Reed2008	Reed (2008)	Medical Tourism	Medical Clinics of North America	15
Epstein2009	Epstein (2009)	Sociological and ethical issues in transplant commercialism	Current Opinion in Organ Transplantation	10
Healy2009	Healy (2009)	Surgical tourism and the globalization of healthcare	Irish Journal of Medical Science	3
HopkinsLRP2010	Hopkins et al. (2010)	Medical tourism today: What is the state of existing knowledge?	Journal of Public Health Policy	18
CrooksKSJ2010	Crooks et al. (2010)	What is known about the patient's experience of medical tourism? A scoping review	BMC Health Services Research	21
CrooksTSJK2011	Crooks et al. (2011)	Promoting medical tourism to India: Messages, images, and the marketing of international patient travel	Social Science & Medicine	8
CrooksS2011Ja	Crooks and Snyder (2011)	Medical tourism What Canadian family doctors should know (in French)	Canadian Family Physician	1
SnyderCAKJ2011	Snyder et al. (2011)	The 'patient's physician one-step removed': the evolving roles of medical tourism facilitators	Journal of Medical Ethics	6
PenneySCJ2011	Penney et al. (2011)	Risk communication and informed consent in the medical tourism industry: A thematic content analysis of Canadian broker websites	BMC Medical Ethics	4
Turner2012d	Turner (2012a)	News media reports of patient deaths following 'medical tourism' for cosmetic surgery and bariatric	Developing World Bioethics	0
JohnstonCS2012	Johnston et al. (2012)	I didn't even know what I was looking for: A qualitative study of the decision-making processes of Canadian medical tourists	Globalization and Health	0
Connell2013	Connell (2013)	Contemporary medical tourism: Conceptualization, culture and commodification	Tourism Management	0

in the MT industry, many countries have been able to identify the growth opportunities of the MT industry, aggressively built infrastructure, and properly appropriated related regulatory policies to promote the optimistic prospects of the industry. Quite a few Success stories are reported in countries like Thailand, India, and Malaysia.

Third, the growth of the MT industry has infused prosperity to the local tourism and health care industries in the destination countries, but could impair the equality of the health care resource distribution between the rich and the poor. If the proceeds gained from MT development can be used to improve the health care infrastructure and the quality of the health care industry in these countries, then the citizens there can certainly enjoy the shared benefits; otherwise, the resources that are diverted to support the MT industry may impair the accessibility and the quality of health care for the domestic people in many of the destination countries. Policies and regulations dealing with the generic equity issues for poorer citizens should be urgently addressed in the destination countries. Nevertheless, at a minimum, MT patients traveling as tourists do make some contribution to the local economy, like other tourists.

Fourth, the advent of new multimedia and information technologies has made major contributions to the MT industry's

growth. The promotional and motivational images portrayed to the public must be delicately articulated where low cost should not be overly stressed even though it is the major motivator. As the MT industry grows, the quality of the infrastructure in the destination countries has also improved dramatically. The subtlety of how to present the proper information to portray contemporary MT images in promotional materials so as to further incentivize more MT patients has started to attract more attention in the literature. One of the subtle notions is that low cost is cited as a key determinant for international patient travel, particularly to developing nations. However, it appears that low cost-related images or messages in promotional materials may bring lower quality, which entails higher risk connotations. Additionally, promotional materials may be designed to be circulated among people who are able to access advanced technologies and to portray safe and advanced treatment facilities in order to dispel potential patients' suspicions that their medical care is inferior due to lower costs. Therefore, only a few low cost-related images or messages in promotional materials have been analyzed.

Fifth, training and accreditation, risk communication, and business dimensions are three important areas that are apparently weak areas that must be fortified and substantiated for all participants in the MT industry, especially the brokers, in order to protect

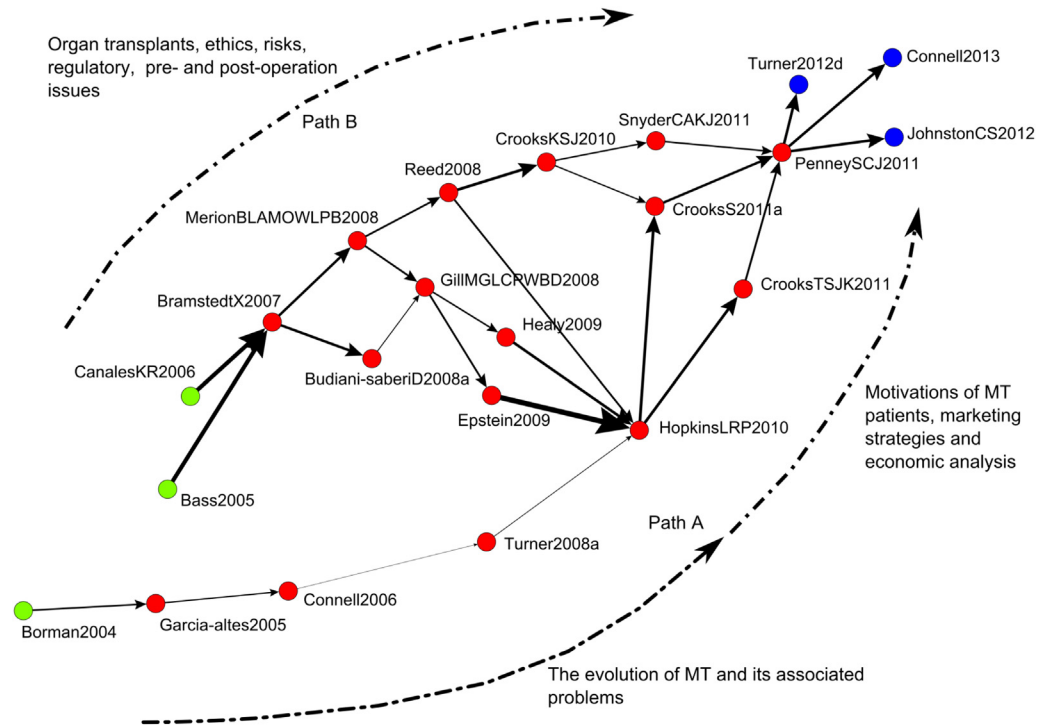


Fig. 4. Development paths of medical tourism studies. The thicker line indicates higher significance of the citation link. The dashed lines indicate the subjects of discussion in different parts of the development paths. The paths are drawn with Pajek software.

patients' rights and to improve the overall quality and the image of the MT industry. The professionalization found on many of the websites, the consistency of the training and accreditation of the brokers, and the clarity and brokers' responsibility before and after care from the disclosure of the service provided to medical tourists certainly deserve major improvements.

3.3.2. Organ transplants, ethics, risks, regulatory, pre- and post-operation issues (Path B)

The other major development path starts out with the paper Bass2005 (Bass, 2005) as the beginning node and PenneySCJ2011 as the final node, as shown in Fig. 4. Earlier MT studies in the literature along this path are more concerned with ethical problems related to transplant tourism. In this path, Bass2005 denoted that in the MT industry, the interrelationship of ethical, legal, and logistical dilemmas facing human tissue transplantation can be extremely complex. Proper legislation, state monitoring, and enforcement can allow an official organ procurement body to recruit live donors and to award compensation on a set scale. This can address issues including privatization of health care based on the free market principle, and the prevention of corruption and human right abuse problems associated with the commercialization of organ transplant. CanalesKR2006 (Canales, Kasiske, & Rosenberg, 2006) first described the medical outcomes, especially medical safety issues, of patients who went overseas for kidney transplants and returned to their home country. BramstedtX2007 (Bramstedt & Xu, 2007) found that the unregulated MT industry may create multiple potential victims – namely, the living organ donor, the recipient, and potentially overseas resident patients awaiting transplant. Budiani-saberiD2008a (Budiani-Saberi & Delmonico, 2008) pointed out that it is mandatory that each country constitute proper regulations and protocols to ensure donor and recipient safety and to improve the overall quality of the facility and operation.

MerionBLAMOWLBP2008 (Merion et al., 2008) reported that there is an increasing number of U.S. patients on the transplant

waiting list who turn to transplants in foreign countries, and that U.S. citizens are much less likely, while both resident and non-resident aliens are much more likely, to pursue foreign transplantation. Budiani-saberiD2008a (Budiani-Saberi & Delmonico, 2008) claimed that the establishment of a healthy cross border health care regulatory and accreditation framework can increase the trust and commitment between all stakeholders in the MT industry, which could help underpin its success and accelerated future growth. GillMGLCPWBD2008 (Gill et al., 2008) indicated that graft and patient survival for those who have gone through a kidney transplant via MT do not seem to be significantly worse among tourists who return, but transplantation abroad is associated with a more complex post-transplantation outcome with a higher rate of acute rejection and increased severity of infectious complications. Epstein2009 (Epstein, 2009) posited that global transplant commercialism has ignited global competition for patients, organs, and investments between the transplant services of affluent and impoverished countries. Healy2009 (Healy, 2009) argued that MT is set to continue with the demand for increased competitiveness and transparency of costs. The MT world is “flat” whereby the industry is able to connect, compete, and collaborate on-line in a manner to flatten the global MT economic playing field. As the quality of the MT service is improving, the industry is better regulated, and the information and communication channels are more open and transparent, the MT literature has started to move from organ transplant ethics- and risk-related issues into other themes. CrooksKSJ2010 (Crooks et al., 2010), CrooksS2011a (Crooks & Snyder, 2011), and Reed2008 (Reed, 2008) focused on themes that are categorized by patients' decision-making factors; motivations related to procedure, travel, and cost; risks associated with patients' health, travel, and pre- and post-operative conditions in the home country; and first-hand experiences, critical issues, and post-recovery life. SnyderCAKJ2011 (Snyder, Crooks, Adams, Kingsbury, & Johnston, 2011) indicated that MT patients often participated the services of a facilitator who may book travel and

accommodation and link the patient with a hospital abroad. The professionalism of the facilitators plays a pivotal role on the effects of medical tourism on patients and public health. Therefore, they provided planned conversation between medical tourism stakeholders to define and shape facilitators' roles.

3.3.2.1. The implications and discussions from the main path analysis along Path B. There are several noteworthy points found in this path. First, the MT industry involves commercialization of organ transplant, which is a very complex issue under constant debate between proponents who are trying to satisfy the insufficient local organ supply and opponents who have pointed out many associated problems antagonizing both donating and recipient countries. Second, the unregulated MT practice may create multiple potential victims – namely, the living organ donor, the recipient, and potentially overseas resident patients awaiting transplant. Third, it appears that there are an increasing number of patients on the transplant waiting list who turn to transplants in foreign countries, with a higher propensity for those citizens with immigrant backgrounds. Fourth, poor vendor screening, selection, and matching in the organ-exporting country and poor record keeping, corruption, and human abuse are factors discouraging global transplant commercialism. Fifth, the survival rates following kidney and liver transplants have drastically improved over the years owing to the discovery of cyclosporine and subsequent advances in organ preservation techniques and transplant immunology. Sixth, in a flat MT world, the growth in MT is largely attributed to the manifestation of the torrent of globalization and business privatization. It is important to conduct regular checks on the cross border trade balance, ethics, risk, and regulatory issues to ensure MT's healthy development.

3.3.3. The implications of the current trend from the main path analysis as Path A and Path B start to merge

The two major paths mentioned above eventually merge to the same node, PenneySCJ2011, as seen in Fig. 4. Here, the attention of the literature is shifting from critics and discussions of the worthiness of the MT industry and the commercialism of organ transplant, which were associated with high risk and voluminous ethics-related issues, to training and accreditation, risk communication, and business dimension-related areas. As a matter of fact, all participants in MT business have demonstrated tremendous energy to transform the industry from relaxation treatment to the improvement of one's well-being and then to more invasive and multifaceted services.

Table 4
Medical tourism themes.

Path A	Path B	Recent
<ol style="list-style-type: none"> 1. MT has demonstrated its prominence in the practical and conceptual domains of tourism. 2. The flow of patients has reversed, directing more to developing countries from developed countries. 3. The growth of the MT industry has infused prosperity to the destination countries, but could impair the equality of the local health care resource distribution. 4. The advent of new multimedia and information technologies has made major contributions to the MT industry's growth. 5. Training and accreditation, risk communication, and business dimensions are three important but apparently weak areas that must be fortified and substantiated for all participants in the MT industry. 	<ol style="list-style-type: none"> 1. The unregulated MT practice may compromise living organ donors, the recipients, and potentially overseas resident patients awaiting a transplant. 2. The number of patients awaiting transplants in foreign countries is increasing, with a higher propensity for those citizens with immigrant backgrounds. 3. Poor vendor screening, selection, and matching in the organ-exporting country and poor record keeping, corruption, and human abuse are factors discouraging global transplant commercialism. 4. The survival rates following kidney and liver transplants have drastically improved owing to the discovery of cyclosporine, advances in organ preservation techniques, and transplant immunology. 5. The growth in MT is largely attributed to the manifestation of the torrent of globalization and business privatization. 	<ol style="list-style-type: none"> 1. The attention of the literature is shifting from critics and discussions of the worthiness of the MT industry to training and accreditation, risk communication, and business dimension-related areas. 2. Contemporary MT issues, including trending gravity, the actual market size, and the roles of every marketing channel, deserve critical analysis. 3. MT is enjoying steady growth, with cosmetic and bariatric surgery dominating media discussions. There is a growing need for contemporary peer-reviewed scholarship to focus on patient mortality in these areas. 4. Word of mouth is a market driver with the Internet having secondary influence. The motivation factors are more layered and dynamic than originally thought.

There are many contemporary MT issues spawning out from this converging node. Connell2013 (Connell, 2013) demonstrated that the actual size of MT, the trending gravity, and the roles of every marketing channel deserve critical analysis. It appears that a lot of MT is short distance and diasporic, which is contrary to many of the beliefs that the international mobility for medical care involves long distance and the procedures and motivations are accidental. Cultural factors are particularly more significant than conventionally recognized. MT is enjoying steady growth, with cosmetic surgery dominating media discussions. Word of mouth is still the market driver with the Internet having secondary influence. Quality and availability of care are the key values, alongside economic and cultural factors.

Turner2012d (Turner, 2012a) studied the mortality of patients traveling abroad for cosmetic surgery or bariatric surgery. Many of the procedures are considered elective procedures that did not have to be performed. There is definitely a growing need for contemporary peer-reviewed scholarship to focus on patient mortality in not only organ transplant procedures, but also on other growing sectors like cosmetics and bariatric medical travel. JohnstonCS2012 (Johnston, Crooks, & Snyder, 2012) conducted a semi-formal interview process and found that the vast majority of participants rely upon the Internet for detailed information. The motivation factors are more layered and dynamic than originally thought. It was found that Canadian medical tourists are motivated by a combination of many incentives, such as cost of care, wait-listing, or the availability of procedures. It has been proven that the MT industry is not ephemeral as it was plagued with many uncertainties in its infancy, but it is shaping up as a successful globalization story. However, new and unanticipated problems will emerge that must be resolved in order to maintain confidence in this burgeoning sector.

The main path analysis provides a way to advance the understanding of the themes and issues concerned in the literature. It also provides a contemporary view of the trend of industry development and business dimensions. Table 4 summarizes the major themes derived from the overall main path analysis.

4. Conclusion

This study is the first attempt to survey the MT literature using a quantitative approach. The authors apply the main path analysis method to identify and illuminate the main themes and key issues amidst the MT literature. The results show two distinctive

development paths that elaborate on different MT themes. One path is more focused on the motivation factors of patients, marketing strategies, and economic analysis, while the other concentrates more on organ transplantation, ethics, risks, and regulatory pre- and post-operation-related issues. Additionally, we find that the number of cosmetics-related MT papers (in the areas of aesthetic, bariatric, and plastic surgery issues), although limited, is experiencing some growth, which implies that it may be the potential star future business in the MT industry. The trend in the number of non-cosmetics-related papers seems to stop growing after 2010. The MT industry is gaining accelerated popularity, and the results of our analysis foresee transplantation to beautification as the future research direction trend.

A basic analysis on the focused issues of the literature implies that there is a pressing need for MT researchers to shift their efforts to economic and marketing issues, which have been outweighed by ethics and risk issues. Several recent studies have been moving towards this direction. For example, Wongkit and McKercher (2013) suggested that other than traditional dedicated and holidaying medical tourists, there are also significant amounts of non-negligible hesitant and opportunistic medical tourists who are open for destination managers to promote their services. Yeoh, Othman, and Ahmad (2013) indicated that word-of-mouth is a potential marketing tool for medical tourism, because medical tourists who seek treatments in Malaysia are highly influenced by friends, family, relatives, and a doctor's referral.

From the discussions in the core literature, it is apparent that there are still many unresolved key issues that deserve attention in order to ensure the sustaining success of the MT industry. How the industry qualifies facilities in a destination country, the lack of benefits to poorer citizens in developing countries offering MT, the privatization of the health care industry, organ procurement policies, dependence of technology, etc. remain generic issues.

The published literature has generated increased competitiveness and transparency in the MT industry, yet it is clear that there is a scarcity of theoretical and empirical understandings of this practice that can ultimately help to understand patients' outcome and experience. Data collection on MT industries can be much improved. Ethics- and risk-related issues like patient information consents, the liability of brokers in the industry, and insurance responsibility deserve much more refined attention. In order to increase the competitiveness and transparency of the MT industry, more in-depth analysis is needed on the rationale for health tourism travel, the behavior of medical tourists, the economic and social impacts of MT, the role and liability of agencies, the hospitality linkages of MT within tourism, ethical concerns, global health restructuring, etc. Finally, future research in the areas of the impact from online electronic word-of-mouth (eWOM), blogs, social networks, etc. to the MT industry may receive more attention.

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