International Journal of Contemporary Tourism Research

e-ISSN: 2587-1528

https://dergipark.org.tr/tr/pub/ijctr

A Systematic Review of Medical Tourism Supply Chain: Current Status and Future Directions

***Yunus Emre AYDIN[1], Hatice ÇALIPINAR[2], Simay Göksü KORKMAZ[3], Leyla KANMAZ DEMİR[4]**

[1]Lec., Kütahya University of Health Sciences, Gediz Vocational School of Health Services, Department of Medical Services and Techniques
E-Mail: yunusemre.aydin@ksbu.edu.tr , ORCID: 0000-0001-9930-9769
[2] Assoc. Prof., Hacettepe University, Faculty of Economics and Administrative Sciences, Department of Business Administration
E-Mail: chatice@hacettepe.edu.tr, ORCID: 0000-0002-5927-1783
[3]Res. Assist., Turkish Aeronautical Association University, Faculty of Business Administration, Department of Logistics Management
E-Mail: sgkorkmaz@thk.edu.tr, ORCID: 0000-0002-5522-3274
[4]Res. Assist., İstanbul Aydın University, Faculty of Health Sciences, Department of Health Management
E-Mail: leylakanmaz@aydin.edu.tr, ORCID: 0000-0002-7426-5269

Keywords
Medical Tourism,
Supply Chain,
Critical Success Factors,
PRISMA

Jel Classification Code(s)
I19

Article Type
Research Article

Abstract

There has been a significant surge in consumers seeking health care abroad, leading to a highly competitive tourism market with substantial profit margins. This systematic review aims to shed light on the medical tourism supply chain (MTSC) literature. Following the PRISMA guidelines, a systematic search was conducted for the term “medical tourism supply chain” across five databases: Scopus, Web of Science, PubMed, ProQuest, and EBSCO, between April and July 2023. Non-English articles and conference proceedings were excluded; ultimately, 16 studies met the inclusion criteria. The MTSC comprises three core components: supply-demand, customer, and supplier management. Trust, cooperation, commitment, and coordination have emerged as critical factors in effective supplier management. Supply-demand management emphasizes human resources, accommodation, and transfer capacity. Lastly, customer relationship management underscores the significance of understanding tourists' intentions and expectations. Despite its critical role, the MTSC remains underexplored. Future research should aim to provide a more comprehensive representation of all stakeholders. Additionally, there is a need for tools to measure the performance of the medical tourism supply chain. Thus, policymakers can determine policies to develop the country's medical tourism potential, and service providers can become more competitive.

Aydın, Y. E., Çalıpınar, H., Korkmaz, S. G., & Kanmaz Demir, L. (2024). A systematic review of medical tourism supply chain: Current status and future directions. *International Journal of Contemporary Tourism Research*, *8*(2), 213-226. http://doi.org/10.30625/ijctr.1525031

Received Date: *31/07/2024* ***Accepted Date:*** *14/12/2024*

****Corresponding Author***

INTRODUCTION

The globalization of healthcare and glaring disparities in the costs and accessibility of medical procedures have made medical tourism a thriving and dynamic sector. Although the coronavirus pandemic temporarily halted the momentum of medical tourism (Chhabra et al., 2021), experts point to a strong recovery in recent years (Shokri Garjan et al., 2023). According to Statista, the sector's value was estimated at USD 54.4 billion in 2020, while projections show that it will exceed USD 200 billion by 2027 (Yang, 2024).

Characterized by patients crossing international borders to access treatment, surgery, and various health care (Nabi et al., 2023), medical tourism offers an alternative route for individuals seeking cost-effective or specialized medical care. However, as Karadayı-Usta and SerdarAsan (2020) highlighted, medical tourism is complex, multifaceted, and indispensably needs effective supply chain management (SCM). Effective SCM is crucial in maintaining the uninterrupted flow of medical tourism operations.

The medical tourism supply chain (MTSC) encompasses the skillful procurement, management, and distribution of medical supplies, medicines, equipment, and necessary services at every stage of the patient treatment process (Demirdogen & Polater, 2016). This process includes operational strategies in the destination country where patients embark on their treatment journey (Connell, 2013). SCM is crucial in sustaining medical tourism, protecting patient safety, and ensuring superior healthcare delivery. Ferrer and Medhekar emphasize that SCM in medical tourism includes aspects such as demand management, supplier collaboration, logistics flow, and resource management (Ferrer & Medhekar, 2012).

Crooks et al. (2010) clearly outline the challenges and hazards permeating the MTSC. These challenges encompass a range of issues intricately woven around patient safety and privacy, quality assurance paradigms, regulatory compliance requirements, information security principles, and ethical considerations. Understanding and addressing these uncertainties effectively is emerging as an indispensable prerequisite for ensuring the sustainability and expansion of the medical tourism sector (Lunt et al., 2014).

This systematic review seeks to demonstrate the importance and implications of SCM in medical tourism, examining ways to optimize a sustainable supply chain to gain an international competitive advantage and best meet the needs of patients. It also aims to highlight the inherent strengths of SCM and provide direction for future research and practical applications in this field. The insights from this scholastic study are expected to provide evidence-based recommendations for healthcare stakeholders, policymakers, and other actors involved in the complex field of medical tourism.

2. CONCEPTUAL FRAMEWORK

2.1. Medical Tourism Phenomenon

Health is a multifaceted concept that varies significantly among individuals. For instance, a physician may conceptualize a health biomedical framework, and a soccer player might primarily associate health with fitness and athletic performance. In 1946, the World Health Organization expanded the understanding of health by defining it as "a state of complete physical, mental, and social well-being," emphasizing that health extends beyond the mere absence of disease or infirmity (Demir, 2020). This holistic definition incorporates both the negative (disease and disability) and positive (well-being and functionality) aspects of an individual's condition, thereby broadening the scope of the term.

Healthcare encompasses a range of activities designed to protect individuals from health risks, treat illnesses, and rehabilitate those with diminished physical or mental capacities. These services aim to prolong life, enhance quality of life, and sustain overall well-being (Zhang et al., 2009). The utilization of healthcare is influenced by three key factors: an individual's capacity to access and utilize healthcare, the availability of healthcare, and the individual's specific healthcare needs. Health tourism emerges as a unique subset of healthcare, facilitating individuals' access to necessary care while promoting well-being (Mojumdar, 2018; Zhang et al., 2009).

Health tourism is a broad term comprising various subfields, including medical tourism, thermal tourism, and elderly or disabled care tourism (Hall, 2011). Connell defines medical tourism as "individuals traveling overseas, often over long distances, to receive medical, dental, or surgical care" (Connell, 2006, p. 1094) While there is no universal consensus on the precise definition of medical tourism (Connell, 2013), it can generally be described as individuals crossing international borders to seek diagnosis, treatment, and rehabilitation services, driven by medical or social needs.

Historically, individuals from underdeveloped or developing countries traveled to developed nations in North America and Western Europe for healthcare services due to long waiting times, the pursuit of higher-quality care, or the unavailability of certain treatments in their home countries. However, since the early 1990s, this trend has shifted (Kurçer & Civelek, 2022). Today, individuals from developed countries increasingly travel to developing regions, particularly South Asia and the Middle East, for healthcare. This shift is primarily motivated by issues such as

prolonged waiting times, high medical costs, legal or ethical restrictions (e.g., abortion, in vitro fertilization, gender reassignment surgeries, or stem cell therapy), lack of insurance coverage for specific procedures (e.g., dental treatments or cosmetic surgeries), and privacy concerns (Hall, 2011; Hopkins et al., 2010).

2.2. Medical Tourism Supply Chain

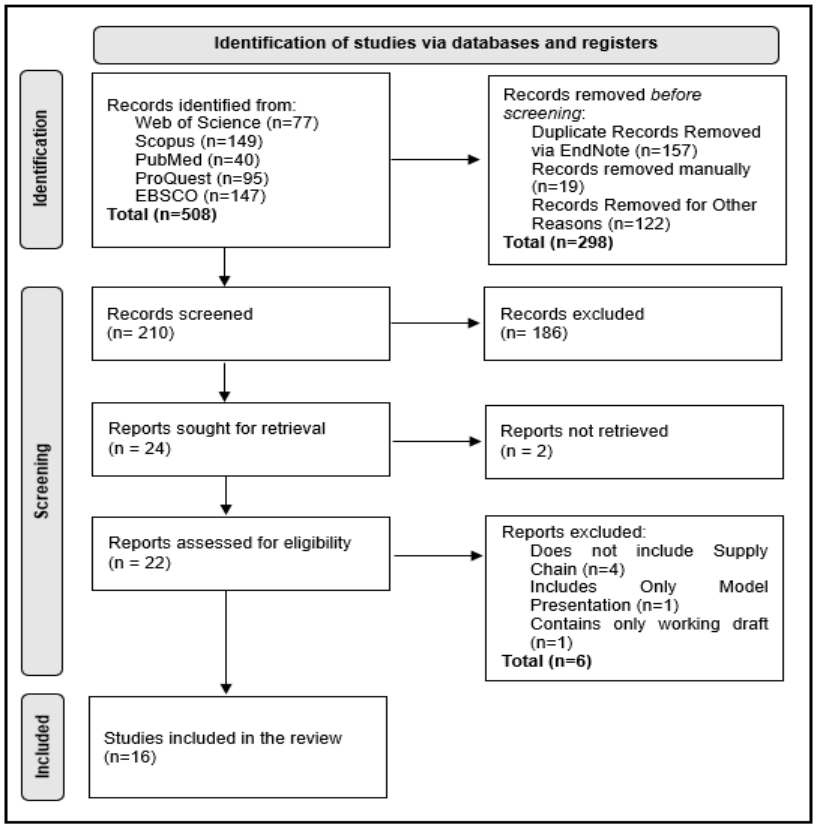
The number of countries aiming to capitalize on the medical tourism market is growing, leading to increased competition. In the post-modern era, competition occurs not between individual businesses or countries but between entire supply chains (Lambert & Cooper, 2000). The supply chain must be effectively and efficiently managed to achieve competitive advantage and ensure customer satisfaction. A supply chain coordinates stakeholders to ensure that products or services are produced and delivered in the right quantity, time, and place, enhancing customer satisfaction and profitability (Ahmadimanesh et al., 2019). Supply chain management involves coordinating relationships among stakeholders—including manufacturers, service providers, distributors, wholesalers, and retailers—throughout the process, from raw materials to delivering a product or service to a satisfied customer (Heizer & Render, 2017).

The MTTZ is a relatively new concept that has emerged in the 21st century. Ferrer and Medhekar (2012) define MTTZ as a structure encompassing marketing, travel, diagnosis, treatment, rehabilitation, care services, and touristic activities. Similarly, Lee and Fernando (2015) describe MTTZ as the intersection of accommodation, medicine, hospitals, transportation, and insurance sectors. The MTTZ is a system centered around the patient, integrating diverse sectors, including consultancy, transportation, healthcare, accommodation, touristic activities, and insurance services (Karadayi-Usta & Serdar-Asan, 2020).

3. METHODOLOGY

In this study, the aim is to systematically analyze scientific publications on the topic of the MTSC through content analysis. The research methodology followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) (Page et al., 2021). PRISMA 2020 is a contemporary reporting guideline for systematic reviews that reflects advancements in identifying, selecting, evaluating, and synthesizing studies (Peters et al., 2020). This method is frequently preferred in a wide range of research areas, from health research to tourism research and supply chain topics, in the literature (Pahlevan-Sharif et al., 2019; Scott Kruse et al., 2018; Soheilirad et al., 2018). Systematic reviews present literature reviews according to a methodology and provide an unbiased source of information for future research. Therefore, the methodology of this study favored the systematic review method.

Figure 1: Medical Tourism Supply Chain PRISMA Flow Diagram



We conducted a systematic review on April 9, 2023, in Scopus, Web of Science, PubMed, ProQuest, and EBSCO. The keywords used in this phase consisted of (health OR healthcare OR "health care" OR medical OR dental OR wellness OR spa) AND (tourism) AND (supply chain) (see Appendix 1). We did not use any specific limitations during the keyword-based searches. However, after consolidating the data, the studies were organized based on study type (articles and conference papers) and language restriction (English). There was no temporal restriction during the research process. We searched all databases and engines to ensure relevant studies were included, using the exact keywords on July 5, 2023. The inclusion criteria encompassed studies addressing the MTSC in any way (such as critical success factors, user or provider perspectives, performance, supplier selection, etc.,). We conducted the search and synthesis processes between April 9 and July 24, 2023. The PRISMA flowchart depicting the research process is presented in Figure 1.

Bibliometric data downloaded from data sources were consolidated using Endnote v.20.2.1. We initially organized the data based on study type. After initial consolidation, duplicate records were removed automatically using Endnote. Remaining duplicates were identified and excluded manually. The studies were then reviewed for language criteria (see Appendix 2).

Up to the stage of determining the articles to be included in the research (labeled as "included"), all stages were independently and blindly reviewed by the authors (YEA, SGK, and LKD). After each stage, we assessed the results through a meeting. Studies accepted by at least two of the three authors were discussed, and a consensus was reached for full-text analysis. We accessed all databases and engines through the Hacettepe University Library. Therefore, accessing the full texts of some studies that required membership was impossible. Additionally, a supervisor (HC) oversaw the authors at each stage.

4. FINDINGS

The research conducted using keywords resulted in a total of 508 bibliometric records. Following independent assessments by the researchers, 210 original studies, complying with language and study type restrictions, were examined based on their titles, abstracts, and keywords. Subsequently, 24 studies were evaluated for full-text analysis at this stage. However, it was not possible to access the full texts of the studies by Chung and Chang (2018), and Bonilla-Hernandez and Martinez-Gutierrez (2021). The remaining 22 studies were included in the full-text analysis independently by the authors, considering their potential relevance to the MTSC.

Following the full-text reviews, the studies by Arulmozhi et al., (2019) and Kaewkitipong et al., (2021) were not included in the review due to their lack of coverage on the supply chain. The study by Vásquez-Bernal et al., (2019) was excluded from the review as it was only a draft text, and the study conducted by Riaz et al., (2022) was also excluded because it focused on a developed model instead of the supply chain.

We examined sixteen studies related to the medical tourism supply chain. In Table 1, we have provided an overview of the key characteristics of these studies, which were determined through consensus among the authors. These studies are relatively evenly distributed regarding their research methods, as shown in Figure 2. Additionally, the research covered a variety of countries. Several studies were conducted in Iran (4 studies) and Thailand (4 studies).

Although Kumar et al., (2012) introduced MTSC to the literature in 2012, studies have shown a limited distribution over the years (see Figure 3). Similarly, there is no homogeneous distribution of studies in the journals where they were published. Most publications were found in the Tourism Management journal (n=3). The included studies, qualitative methods such as in-depth interviews and semi-structured interviews were generally used, along with quantitative methods based on primary or secondary data or model development techniques. The most preferred methodological approach was structural equation modeling (n=4).

Figure 2: Metadologies of studies

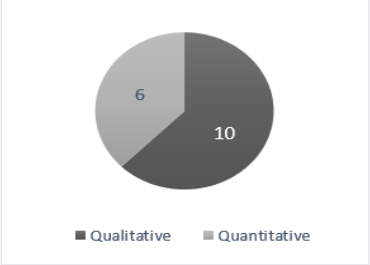
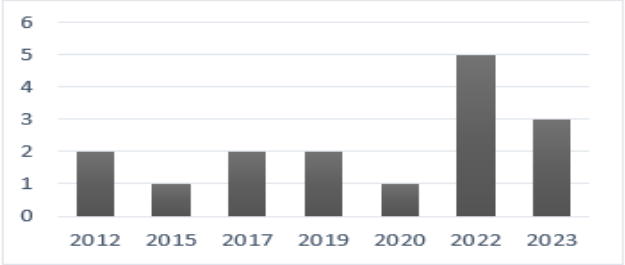


Figure 3: Publications years



Many studies addressing the MTSC focus on critical success factors within the supply chain from the service providers' perspectives. Fongtanakit et al., (2019), Lee and Fernando (2015), Nasrabadi and Mohammadipour (2022), Rahman and Zailani (2017) and Sutinee et al., (2022) have investigated MTSC critical success factors using different scales and techniques. The sample sizes in these studies range from 20 to 217 individuals. In a study conducted by Akenroye et al., (2023) a group of 15 experts examined the obstacles and challenges ahead of organ transplant

tourism, a derivative of medical tourism, intending to develop an appropriate supply chain model. Skountridaki's (2017) research distinguished itself and, conversely, investigated physicians' perspectives through semi-structured interviews, setting it apart from other studies.

The second group of studies has examined motivating factors for tourists within the MTSC. The study conducted by Ferrer and Medhekar is one of the pioneering works in the MTSC literature that investigated medical tourism demand through factors such as cost, waiting time, and privacy (Ferrer & Medhekar, 2012). The authors developed a Likert-type scale, collected the data from 1,273 Australian participants, and analyzed the data using regression analysis. Intakarn and Wangkananon (2022) undertook a similar research effort focusing on Thai traditional medicine tourism. This study also employed a Likert-type scale and reached 400 participants, with data being analyzed through structural equation modeling.

Conceptual and theoretical research constitutes the third group of studies. The study by Kumar et al., (2012) addressed the contribution of medical tourism to the global healthcare supply chain. Through Monte Carlo Simulation on secondary data, they demonstrated how much the global healthcare supply chain could save if some surgeries performed in developed countries were carried out in countries like India or Thailand. In the study conducted by Karadayi-Usta and SerdarAsan (2020), a literature review, in-depth interviews, and expert opinions (n=30) were utilized. In this qualitative study, the aim was to determine the elements comprising MTSC. A similar study was conducted by Janchai et al., (2022) using an ontological approach. This study involved interviews with industry experts (n=16) to identify the relationships among the elements constituting MTSC.

The fourth group of studies comprises mathematical modeling research that designs the supply chain or tests the optimal supply chain network in the real world. Ahmadimanesh et al., (2019) conducted the first of these studies in dental health tourism. The aim was to create an optimal supply chain network between medical tourists, healthcare facilities, and accommodation services. The developed mathematical model was applied to a case through sensitivity analysis, revealing the level of profitability increase when an ideal balance between supply and demand is achieved. Hasannia Kolaee and Mirzapour Al-e-Hashem (2022) conducted a similar study and developed an algorithm to increase the profitability of medical tourism centers through applied scenarios and sensitivity analysis. Shokri Garjan et al. (2023) developed a mathematical model for wellness tourism centers and applied sensitivity analysis. However, Karadayi-Usta and SerdarAsan's (2023) study aimed to determine the ideal supplier selection for a dental health center, distinguishing itself from the others. A fuzzy linear programming model was preferred as a multi-criteria selection technique.

5. DISCUSSION

Medical tourism is a significant and shared component of the tourism and healthcare sectors. This sector generates billions of dollars annually. People travel across borders for various medical interventions, such as major surgical procedures, cosmetic treatments, and dental care, due to cost-benefit advantages like shorter waiting times, lower pricing, and the availability of expert treatments (Nelson, 2014). Considering the potential for cost savings in the global healthcare service supply chain through medical tourism (Kumar et al., 2012), the sector's rapid growth appears inevitable (Hyder et al., 2019).

While the concept of the supply chain has been discussed in the literature for many years (Mentzer et al., 2001), the notion of a sustainable supply chain remains a relatively recent development (Seuring & Müller, 2008). The recent global pandemic highlights the importance of reliable and effective SCM (Fongtanakit et al., 2019; Francis, 2020). Moreover, the supply chain perspective applies significantly to the medical tourism sector because the sector consists of interconnected actors (Zailani et al., 2015). Therefore, it is crucial to accurately identify the relationships between each actor in the supply chain that constitutes a sustainable supply chain and the factors influencing these relationships (Bratt et al., 2021).

The elements constituting the MTSC have been discussed individually but were first conceptually addressed in the study by Lee and Fernando (2015). MTSC encompasses elements of both the healthcare and tourism sectors, derived from the concept of the tourism supply chain. It includes various services such as healthcare, transportation, accommodation, insurance, and consulting services, among others. The increasing trend in medical tourism mobility and the appeal of the complex supply chain structure to researchers contribute to the growing number of studies on the medical tourism supply chain.

Table 1. Medical Tourism Supply Chain Literature

No	Author(s)	Year	Journal/Conference	Country	Method(s)	Focus
1	Kumar et al.,	2012	Journal of Health Communication	USA	Monte carlo simulation	Savings impact of medical tourism on the global healthcare supply chain
2	Ferrer & Medhekar	2012	GSTF Business Review	Australia	Multiple regression analysis	MTSC factors from a consumers' perspective
3	Lee & Fernando	2015	Tourism Management	Malaysia	Structural equation modeling	MTSC factors and interrelationships from practitioners' perspective
4	Rahman & Zailani	2017	Journal of Islamic Marketing	Malaysia	Structural equation modeling	Muslim friendly MTSC factors and interrelationships from practitioners' perspective
5	Skountridaki	2017	Tourism Management	Greece	Qualitative analysis (semi-structured interview)	Physician and facilitators relationships in MTSC in the context of Sociology of Professions
6	Ahmadimanesh, et al.,	2019	Tourism Management	Iran	Mathematical modeling	Optimum profitability balance between supply and demand for hotel and dental facilities
7	Fongtanakit, et al.,	2019	International Journal of Supply Chain Management	Thailand	Structural equation modeling	MTSC factors and interrelationships from practitioners' perspective
8	Karadayi-Usta & SerdarAsan	2020	Journal of Industrial Engineering and Management	Türkiye	Triangulation (literature, in-depth intv., experts)	Developing a conceptual model for MTSC
9	Hasannia Kolaee & Mirzapour Al-e-Hashem	2022	RAIRO - Operations Research	Iran	Hybrid Meta-heuristic Algorithm	A mathematical model on the logistics activities of patients in medical tourism
10	Intakarn & Wangkananon	2022	Hong Kong Journal of Social Sciences	Thailand	Structural equation modeling	MTSC factors from a consumers' perspective
11	Janchai, et al.,	2022	International Journal of Advanced Computer Science and Applications	Thailand	Ontology modeling	An ontological model for MTSC
12	Nasrabadi & Mohammadipour	2022	Journal of Health Administration (مدیریت سلامت)	Iran	Interpretive structural modelling (ISM)	MTSC critical success factors from practitioners' perspective
13	Sutinee, et al.,	2022	5th International Conference on Computers in Management and Business	Thailand	Thematic analysis (semi-structured interview)	MTSC critical success factors from practitioners' perspective
14	Shokri Garjan, et al.,	2023	Expert Systems with Applications	Iran	Mathematical modeling	Developing a sustainable model that maximizes profit and ensures customer satisfaction in the MTSC
15	Akenroye, et al.,	2023	Supply Chain Management: An International Journal	Nigeria & Uganda	Interpretive structural modelling	Challenges and interactions in the organ transplant supply chain are analyzed based on socio-technical systems theory.
16	Karadayi-Usta & SerdarAsan	2023	OPSEARCH	Türkiye	A fuzzy linear programming	A fuzzy linear model for structuring supplier selection and MTSC according to customers' preferences

5.1. Conceptual Works

In the ontological study led by Janchai et al., (2022), it is identified that medical tourism comprises two primary components: medical care and tourism. Additionally, the outcomes of this ontological investigation reveal that the context shaping the MTSC includes various elements, such as actors, roles, processes, activities, flows, and products/services. A unique characteristic distinguishing MTSC from conventional supply chains and logistics operations is its focus on a single actor throughout all stages—the medical tourist. Similar findings are reflected in the tourism supply chain literature. For instance, Molefe et al. (2018) emphasize that the tourism supply chain centers around the tourist and comprises services like transportation, entertainment, food, accommodation, shopping, and infrastructure.

Karadayi-Usta and SerdarAsan (2020) highlight that medical tourism consists of two main categories, under which relational factors exist, such as service design (quality and package programs), demand, capacity and human resource management, supplier relationships (trust, collaboration, and coordination), and customer relationship management (consulting, advertising, and marketing). These findings align with the broader tourism supply chain literature, as further discussed by Chen, (2009), Jain et al., (2022), Molefe et al., (2018), Zailani et al., (2015).

5.2. Main Topic: MTSC Critical Success Factors

A substantial portion of research examines the various components and relationships within the MTSC from the perspective of industry experts. In alignment with findings in the tourism supply chain domain (Molefe et al., 2018), medical tourism providers consistently rank "trust," "collaboration," and "coordination" as the most pivotal elements within the supply chain. For instance, Nasrabadi and Mohammadipour (2022) conclude that environmental management is a critical success factor for organizations in Iran. Here, "environmental management" refers to the influence of the supply chain shaped by national and international economic conditions, which are more relevant to governments than individual organizations. Similarly, Jain et al. (2022) identify the management of economic conditions as a high-impact factor in enhancing the resilience of tourism businesses during the Covid-19 pandemic. Nasrabadi and Mohammadipour (2022) further find that supply chain flexibility, coordination, and collaboration are equally critical factors.

In the supply chain, "trust" and "collaboration" are closely intertwined. As actors develop trust in each other, they seize opportunities for collaboration (Fongtanakit et al., 2019). Interpersonal trust among actors enhances collaboration, which in turn positively impacts the profitability of other units within the chain (Chen, 2009). For businesses operating in medical tourism, trust management is essential yet costly. To address this challenge, an evaluation system for trust management should be developed and ideally overseen by an impartial entity. Such a system would ensure that stakeholders violating trust could be removed from the supply chain to preserve its integrity.

Collaboration is an important critical success factor because it directly affects organizational performance (Rahman & Zailani, 2017). According to experts in the tourism sector, effective cooperation between stakeholders of the supply chain is seen as key to ensuring customer satisfaction (Kozicka et al., 2019). Particularly during economic crises, collaboration enables businesses to achieve economies of scale and withstand adverse conditions. For example, Campiranon & Scott, (2014) state that collaborations with suppliers, such as tour operators, help businesses reduce service costs and provide customers with optimal options. However, the relationship between collaboration and financial performance is debatable. Lee and Fernando (2015) find no clear relationship between collaboration and financial or non-financial performance. Nevertheless, Rahman and Zailani's (2017) observe that efficiency positively influences collaboration, which subsequently enhances financial performance.

Fongtanakit et al., (2019) conclude that "commitment" and "coordination" are closely related, and coordination positively influences financial performance. Conversely, Lee and Fernando (2015) identify a positive relationship between information sharing and organizational financial performance, and a negative relationship between organizational non-financial performance. On the other hand, experts note that the exchange of information between stakeholders in the tourism supply chain solves many problems and has the potential to create value for customers (Kozicka et al., 2019). However, due to the specificity of healthcare, actors should be aware that excessive information sharing may lead to potential loss of customers or compromise the security and confidentiality of patients. Therefore, various mechanisms such as confidentiality agreements should be implemented to prevent violations of security and privacy.

"Supplier selection" is one of the key factors in the success of the MTSC. Kozicka et al. (2019) state that stakeholders in a supply chain have different goals, so businesses should ensure their objectives align with those of the stakeholders they choose to work with. In the tourism supply chain literature, cost, quality, capacity, and reliability are emphasized as crucial factors in supplier selection (Ariya & Chakpitak, 2016; Salihoğlu & Gezici, 2018). Similarly, Karadayi-Usta and SerdarAsan (2023) investigate the supplier selection criteria of consultancy firms based on medical tourist preferences. The study finds that consultancy firms consider the supplier's market reputation, physical

infrastructure, quality certifications, and customer satisfaction in their supplier selection process. Therefore, organizations should prioritize these factors.

Another factor in the MTSC is "demand management." Achieving the ideal balance between supply and demand is crucial for all product and service operations (Fung & Fung, 2014; Jain et al., 2022) because demand management is closely related to the financial performance (Zailani et al., 2015). Effective demand management enhances an organization's financial performance. A study by Ahmadimanesh et al., (2019) show that medical facilities had sufficient service delivery capacity, but accommodation facilities needed to improve in quality and capacity. As a result, the profitability of the supply chain decreased. Therefore, planning ideal accommodation services is essential for medical tourists and tourist activities.

Ferrer and Medhekar (2012) assert that reasonable treatment costs, reduced waiting times, and preserving privacy will increase the demand for medical tourism. Likewise, in a study conducted on customers and service providers in Singapore, the level of service readiness, consultant availability, and short waiting times were found to be critical success factors (Sutinee et al., 2022). Therefore, organizations and policymakers should consider travel duration, treatment time, and recreational tourism areas when planning patients' trip (Hasannia Kolaee & Mirzapour Al-e-Hashem, 2022). Consequently, organizations should offer packages that align with customer profiles and preferences regarding both price and quality (Shokri Garjan et al., 2023). This way, organizations can establish a profitable and sustainable supply chain.

5.3. Other Topics

In their study on traditional Thai medical tourism, Intakarn and Wangkananon (2022) identify factors such as "transportation," "quality," and "marketing" that influence customer preferences. Furthermore, improving supply chain activities enhances service quality and creates a competitive advantage. Additionally, transportation and promotional activities between medical and leisure tourism increase the profitability of the supply chain. Xinyue & Yongli, (2008) note that the main challenge of the tourism supply chain is to meet customer demands by integrating diverse and personalized services provided by enterprises. Therefore, organizations can derive maximum value from tourists by offering packages that combine medical and leisure tourism, leading to a competitive advantage.

Doctors play a vital role as key stakeholders in the medical tourism industry within the healthcare. It is imperative to assess the viewpoints of doctors about the MTSC, particularly those working in small and medium-sized enterprises. Concordantly, Skountridaki (2017) highlights that doctors in management positions place significant emphasis on the role of agencies when it comes to expanding their services into international markets. Agencies connect the supply chain through advertising and promotional activities (Chen, 2009). However, doctors perceive that these intermediaries create expectations beyond medical standards, exert pricing pressures due to information asymmetry, and lack transparency in their operations. This situation undermines trust and collaboration among the stakeholders in the supply chain. Therefore, close communication should be established with agencies and the supply process should not be left to their discretion.

"Customer relationship management" is a crucial factor affecting the financial performance of tourism supply chains (Zailani et al., 2015). Organizations planning advertising and promotional activities for sustainable supply chains must deeply understand tourists' intentions, expectations, and satisfactions (Sigala, 2014). Tourists should be well-informed about the risks and benefits they may encounter during their travels (Kumar et al., 2012). Therefore, Chen (2009) suggests the establishment of "tourism quality monitoring departments" to develop the tourism supply chain. Considering the unique risks in healthcare, governments must make structural reforms that facilitate coordination among stakeholders and address these problems. These structural reforms include building an information system, conducting workforce planning, establishing regulatory authorities, and implementing comprehensive legal regulations. Indeed, in the study conducted by Akenroye et al., (2023) on organ transplant tourism, it was observed that deficiencies in information systems, an unskilled workforce, and a lack of legal regulations weakened the supply chain network.

CONCLUSION

The medical tourism sector has experienced substantial growth, prompting a surge in research focused on its supply chain. This systematic review underscores the pivotal role of supply chain management in the burgeoning medical tourism sector, which operates at the intersection of healthcare and tourism. Medical tourism supply chains (MTSC) are integral to ensuring the seamless delivery of healthcare services to international patients while maintaining high efficiency, quality, and cost-effectiveness standards. A systematic analysis of 16 studies reveals that effective MTSC management relies on key components such as supplier relationships, demand management, and customer engagement. Critical success factors such as trust, collaboration, coordination, and supplier selection have been identified as instrumental in optimizing MTSC performance. The review also concluded that the diversity of studies in the MTSC field should be increased in terms of the countries investigated, the methodologies used, and the diversity of stakeholders considered.

Study Limitations and Directions for Future Research

Despite its evident importance, research on MTSC remains limited in scope and diversity. Studies to date have primarily focused on select regions such as Iran, Thailand, and Malaysia, leaving significant gaps in global representation. However, by broadening the scope of the literature to include examples from a more comprehensive array of countries, we can glean more insightful information for developing a sustainable global supply chain. Thus, there is a call for research in the supply chain domain to encompass leading countries in the medical tourism sector, such as South Korea, Singapore, Spain, and India (Nabi et al., 2023).

Likewise, interdisciplinary research combining qualitative and quantitative methodologies can yield a more profound understanding of the subject matter. As such, we advocate for conducting more comprehensive and in-depth studies that actively solicit input from all stakeholders. Furthermore, there is a pressing need for an increase in the number of studies that seek to capture the viewpoints of both medical tourists and healthcare professionals regarding the MTSC.

Our final recommendation pertains to the future direction of research in this field. It would be advantageous for upcoming studies to focus on developing scales encompassing various sub-dimensions, such as the critical success factors, levels of satisfaction, limitations, and barriers within the MTSC. This approach will generate more precise, dependable, and evidence-based outcomes concerning the MTSC, facilitating comprehensive international insights through meta-analyses.

The principal constraint in our systematic review emanates from the novelty of the MTSC domain. Consequently, the pool of studies available for inclusion in our review remains relatively constrained. A secondary limitation pertains to restricting our review to studies published in English, potentially excluding pertinent research published in other languages. A further constraint concerns our inability to access specific studies that necessitate membership or do not offer full-text accessibility through the databases. Given the anticipated expansion of research in this field in the forthcoming years, we recommend that future reviews take cognizance of these limitations and endeavor to refine their research methodologies accordingly.

REFERENCES

Ahmadimanesh, F., Paydar, M. M., & Asadi-Gangraj, E. (2019). Designing a mathematical model for dental tourism supply chain. *Tourism Management, 75*, 404–417. https://doi.org/10.1016/j.tourman.2019.06.001

Akenroye, T. O., Oyedijo, A., Rajan, V. C., Zsidisin, G. A., Mkansi, M., & Baz, J. E. (2023). Connecting the dots: Uncovering the relationships between challenges confronting Africa's organ transplant supply chain systems. Supply Chain Management: *An International Journal*, *28*(7), 43–61. https://doi.org/10.1108/SCM-12-2022-0457

Ariya, P., & Chakpitak, N. (2016). Systems thinking in online travel agency of supplier relationship management. *International Journal of Innovation and Learning, 19*(1), 63. https://doi.org/10.1504/IJIL.2016.073290

Arulmozhi, S. J., Praveenkumar, K., & Vinayagamoorthi, G. (2019). Medical Tourism in India. *International Journal of Recent Technology and Engineering*, *8*(2S10), 695–698. https://doi.org/10.35940/ijrte.B1123.0982S1019

Bratt, C., Sroufe, R., & Broman, G. (2021). Implementing Strategic Sustainable Supply Chain Management. *Sustainability, 13*(15), 8132. https://doi.org/10.3390/su13158132

Bonilla-Hernandez, A. L., & Martinez-Gutierrez, R. (2021). *Innovation in Value Chain in the Medical Tourism Industry in Tijuana, Baja California*. International Conference on Applied Human Factors and Ergonomics, 273, 512-517. https://doi.org/10.1007/978-3-030-80713-9_65

Campiranon, K., & Scott, N. (2014). Critical Success Factors for Crisis Recovery Management: A Case Study of Phuket Hotels. *Journal of Travel & Tourism Marketing, 31*(3), 313–326. https://doi.org/10.1080/10548408.2013.877414

Chen, D. (2009). *Innovation of Tourism Supply Chain Management*. 2009 International Conference on Management of E-Commerce and e-Government, 310–313. https://doi.org/10.1109/ICMeCG.2009.79

Chhabra, A., Munjal, M., Mishra, P. C., Singh, K., Das, D., Kuhar, N., & Vats, M. (2021). Medical tourism in the COVID-19 era: Opportunities, challenges and the way ahead. *Worldwide Hospitality and Tourism Themes, 13*(5), 660–665. https://doi.org/10.1108/WHATT-05-2021-0078

Chung, K. C., & Chang, L. C. (2018). A Sustainability Strategy Assessment Framework Model for Medical Tourism Supply Chain in Asia. *Journal Of Testing and Evaluation, 46*(2), 745-755. https://doi.org/10.1520/Jte20160424

Connell, J. (2006). Medical tourism: Sea, sun, sand and … surgery. *Tourism Management*, *27*(6), 1093–1100. https://doi.org/10.1016/j.tourman.2005.11.005

Connell, J. (2013). Contemporary medical tourism: Conceptualisation, culture and commodification. *Tourism Management, 34*, 1–13. https://doi.org/10.1016/j.tourman.2012.05.009

Crooks, V. A., Kingsbury, P., Snyder, J., & Johnston, R. (2010). What is known about the patient's experience of medical tourism? A scoping review. *BMC Health Services Research, 10*(1), 266. https://doi.org/10.1186/1472-6963-10-266

Demir, B. (2020). Sağlığın kavramsallaştırılması ve insan odaklı sağlık hizmetlerinde kalite ve akreditasyon perspektifi. *İnsan ve İnsan Dergisi*, 62–83. https://doi.org/10.29224/insanveinsan.675151

Demirdogen, O., & Polater, A. (2016). Sağlık sektöründe tedarik zinciri yönetimi ve müşteri isteklerini karşılayabilme yeteneğinin incelenmesi: Ölçek geliştirme çalışması. *Erzincan Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 9*(2), 39–54.

Ferrer, M., & Medhekar, A. (2012). The Factors Impacting on the Management of Global Medical Tourism Service Supply Chain. *Joumal on GSTF Business Review, 2*(2), 206–211.

Fongtanakit, R., Somjai, S., Prasitdumrong, A., & Jermsittiparsert, K. (2019). The Determinants of the Medical Tourism Supply Chain of Thailand. *International Journal of Supply Chain Management, 8*(6), 291–300.

Francis, J. R. (2020). COVID-19: Implications for Supply Chain Management. *Frontiers of Health Services Management, 37*(1), 33–38. https://doi.org/10.1097/HAP.0000000000000092

Fung, W. S. L., & Fung, R. Y. K. (2014). *The development of a supply chain model for tourism crisis management.* 2014 IEEE International Conference on Management of Innovation and Technology, 284–289. https://doi.org/10.1109/ICMIT.2014.6942439

Hall, C. M. (2011). Health and medical tourism: A kill or cure for global public health? *Tourism Review, 66*(1/2), 4–15. https://doi.org/10.1108/16605371111127198

Hasannia Kolaee, M., & Mirzapour Al-e-Hashem, S. M. J. (2022). Stochastic medical tourism problem with variable residence time considering gravity function. *RAIRO - Operations Research, 56*(3), 1685–1716. https://doi.org/10.1051/ro/2022082

Heizer, J., & Render, B. (2017). *Üretim yönetimi: Sürdürülebilirlik ve tedarik zinciri yönetimi* (U. F. Tuzkaya, Trans.; 11.bs'dan çeviri). Palme Yayıncılık.

Hopkins, L., Labonté, R., Runnels, V., & Packer, C. (2010). Medical tourism today: What is the state of existing knowledge? *Journal of Public Health Policy, 31*(2), 185–198. https://doi.org/10.1057/jphp.2010.10

Hyder, A. S., Rydback, M., Borg, E., & Osarenkhoe, A. (2019). Medical tourism in emerging markets: The role of trust, networks, and word-of-mouth. *Health Marketing Quarterly, 36*(3), 203–219. https://doi.org/10.1080/07359683.2019.1618008

Intakarn, J., & Wangkananon, W. (2022). Supply Chain Management Model of Thai Traditional Medical Tourism. *Hong Kong Journal of Social Sciences, 59*, 520-529.

Jain, A., Shanker, S., & Barve, A. (2022). Resilience against the COVID-19 pandemic: Is the hotel and tourism supply chain on the right path? Benchmarking: *An International Journal, 29*(10), 3194–3225. https://doi.org/10.1108/BIJ-05-2021-0249

Janchai, W., Bouras, A., & Siddoo, V. (2022). An Ontology Model for Medical Tourism Supply Chain Knowledge Representation. *International Journal of Advanced Computer Science and Applications, 13*(4), 232-240.

Kaewkitipong, L., Chen, C., & Ractham, P. (2021). Examining Factors Influencing COVID-19 Vaccine Tourism for International Tourists. *Sustainability, 13*(22), 12867. https://doi.org/10.3390/su132212867

Karadayi-Usta, S., & SerdarAsan, S. (2020). A Conceptual Model of Medical Tourism Service Supply Chain. *Journal of Industrial Engineering and Management, 13*(2), 246-265. https://doi.org/10.3926/jiem.3008

Karadayi-Usta, S., & SerdarAsan, S. (2023). Supplier selection and capacity allocation in medical tourism service supply chain. *OPSEARCH*. https://doi.org/10.1007/s12597-023-00649-w

Kozicka, K., Kot, S., & Riana, I. G. (2019). The Efficiency of cooperation between the participants in the supply chain in the tourism-related branch of industry in relation to client satisfaction. *Sustainability, 11*(17), 4716. https://doi.org/10.3390/su11174716

Kumar, S., Breuing, R., & Chahal, R. (2012). Globalization of health care delivery in the United States through medical tourism. *J Health Commun, 17*(2), 177–198. https://doi.org/10.1080/10810730.2011.585699

Kurçer, D., & Civelek, M. (2022). The determination of the status of Turkey in the medical tourism market in accordance with the demands of health tourists. *Uluslararası Türk Dünyası Turizm Araştırmaları Dergisi, 7*(1), 27–42. https://doi.org/10.37847/tdtad.1030560

Lambert, D. M., & Cooper, M. C. (2000). Issues in supply chain management. *Industrial Marketing Management, 29*(1), 65–83. https://doi.org/10.1016/S0019-8501(99)00113-3

Lee, H. K., & Fernando, Y. (2015). The antecedents and outcomes of the medical tourism supply chain. *Tourism Management, 46*, 148–157. https://doi.org/10.1016/j.tourman.2014.06.014

Lunt, N., Smith, R. D., Mannion, R., Green, S. T., Exworthy, M., Hanefeld, J., Horsfall, D., Machin, L., & King, H. (2014). Implications for the NHS of inward and outward medical tourism: A policy and economic analysis using literature review and mixed-methods approaches. *Health Services and Delivery Research, 2*(2), 1–234. https://doi.org/10.3310/hsdr02020

Mentzer, J. T., DeWitt, W., Keebler, J. S., Min, S., Nix, N. W., Smith, C. D., & Zacharia, Z. G. (2001). Defining Supply Chain Management. *Journal of Business Logistics, 22*(2), 1–25. https://doi.org/10.1002/j.2158-1592.2001.tb00001.x

Mojumdar, S. K. (2018). Determinants of health service utilization by urban households in India: A multivariate analysis of NSS case-level data. *Journal of Health Management, 20*(2), 105–121. https://doi.org/10.1177/0972063418763642

Molefe, P., Tauoatsoala, P., Sifolo, P., Pfarelo, S., Unathi, M., Henama, S., & Henama, U. (2018). The effects of tourism supply chain management practices on tourism operations in Pretoria, South Africa. *African Journal of Hospitality, Tourism and Leisure, 7*.

Nabi, N. U., Khan, S. M., Misbauddin, S. M., & Fatema, K. (2023). Why is India a popular destination for Bangladeshi medical tourists? A study based on perceived justice by Bangladeshi patients. *International Journal of Pharmaceutical and Healthcare Marketing, 17*(3), 265–287. https://doi.org/10.1108/IJPHM-07-2021-0072

Nasrabadi, E. M., & Mohammadipour, E. (2022). A conceptual model of critical success factors in improving the resilience of the health tourism supply chain: A case study. *Journal of Health Administration, 25*(2), 9-25. https://doi.org/10.22034/25.2.9

Nelson, R. (2014). Infectious risks of medical tourism. *The Lancet Infectious Diseases, 14*(8), 680–681. https://doi.org/10.1016/S1473-3099(14)70861-8

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., & Moher, D. (2021). Updating guidance for reporting systematic reviews: Development of the PRISMA 2020 statement. *Journal of Clinical Epidemiology, 134*, 103–112. https://doi.org/10.1016/j.jclinepi.2021.02.003

Pahlevan-Sharif, S., Mura, P., & Wijesinghe, S. N. R. (2019). A systematic review of systematic reviews in tourism. *Journal of Hospitality and Tourism Management, 39*, 158–165. https://doi.org/10.1016/j.jhtm.2019.04.001

Peters, M. D. J., Marnie, C., Tricco, A. C., Pollock, D., Munn, Z., Alexander, L., McInerney, P., Godfrey, C. M., & Khalil, H. (2020). Updated methodological guidance for the conduct of scoping reviews. *JBI Evidence Synthesis, 18*(10), 2119–2126. https://doi.org/10.11124/JBIES-20-00167

Rahman, M. K., & Zailani, S. (2017). The effectiveness and outcomes of the Muslim-friendly medical tourism supply chain. *Journal of Islamic Marketing, 8*(4), 732–752. https://doi.org/10.1108/Jima-11-2015-0082

Riaz, M., Pamucar, D., Habib, A., & Jamil, N. (2022). Innovative bipolar fuzzy sine trigonometric aggregation operators and SIR method for medical tourism supply chain. *Mathematical Problems in Engineering*, 2022. https://doi.org/Artn 4182740 10.1155/2022/4182740

Salihoğlu, G., & Gezici, F. (2018). Geography of suppliers in the hospitality sector: The case of Alanya. *Tourism Management, 65*, 41–54. https://doi.org/10.1016/j.tourman.2017.09.017

Scott Kruse, C., Karem, P., Shifflett, K., Vegi, L., Ravi, K., & Brooks, M. (2018). Evaluating barriers to adopting telemedicine worldwide: A systematic review. *Journal of Telemedicine and Telecare, 24*(1), 4–12. https://doi.org/10.1177/1357633X16674087

Seuring, S., & Müller, M. (2008). From a literature review to a conceptual framework for sustainable supply chain management. *Journal of Cleaner Production, 16*(15), 1699–1710. https://doi.org/10.1016/j.jclepro.2008.04.020

Shokri Garjan, H., Paydar, M. M., & Divsalar, A. (2023). A sustainable supply chain for a wellness tourism center considering discount and quality of service. *Expert Systems with Applications*, 211, 118682. https://doi.org/10.1016/j.eswa.2022.118682

Sigala, M. (2014). Customer involvement in sustainable supply chain management: A research framework and implications in tourism. *Cornell Hospitality Quarterly, 55*(1), 76–88. https://doi.org/10.1177/1938965513504030

Skountridaki, L. (2017). Barriers to business relations between medical tourism facilitators and medical professionals. *Tourism Management, 59*, 254–266. https://doi.org/10.1016/j.tourman.2016.07.008

Soheilirad, S., Govindan, K., Mardani, A., Zavadskas, E. K., Nilashi, M., & Zakuan, N. (2018). Application of data envelopment analysis models in supply chain management: A systematic review and meta-analysis. *Annals of Operations Research, 271*(2), 915–969. https://doi.org/10.1007/s10479-017-2605-1

Sutinee, S., Shunmugham, G. P., & Saeyeon, R. (2022). *An Exploratory Study of Identifying Critical Success Factors for Customer Preferences in Medical Tourism Supply Chain using MAXQDA 2022*. 2022 5th International Conference on Computers in Management and Business (ICCMB), 204–208. https://doi.org/10.1145/3512676.3512711

Vásquez-Bernal, O. A., Pinzo´n-Hoyos, B., & Mosquera-Laverde, W. E. (2019). *Medical tourism in Colombia: A documentary analysis of the components of economic, social and environmental sustainability*. Proc. Int. Conf. Ind. Eng. Oper. Manage., 435–438.

Xinyue, H., & Yongli, T. (2008). *Integrated tourism service supply chain management: Concept and operations processes*. 2008 International Conference on Neural Networks and Signal Processing, 644–647. https://doi.org/10.1109/ICNNSP.2008.4590430

Yang, J. (2024, February 21). Value of the medical tourism market worldwide from 2024 to 2029 [Private]. Statista. https://www.statista.com/statistics/1084720/medical-tourism-market-size-worldwide/

Zailani, S., Iranmanesh, M., Yusof, N., & Ansari, R. (2015). Effects of service supply chain practices on the profitability of tourism firms. *Anatolia, 26*(4), 612–623. https://doi.org/10.1080/13032917.2015.1046084

Zhang, R., Chen, R., & Zhang, Y. (2009). *The Conceptual Model of the Service Supply Chain Research Based on Business Processes*. 2009 International Conference on Management and Service Science, 1-4. https://doi.org/10.1109/ICMSS.2009.5301600

Ethical Approval

This study is among the studies that do not require ethics committee approval.

Researchers' Contribution Rate

The authors contributed equally to the study.

Conflict of Interest

The authors declare that they have no conflicts of interest.

Appendix 1. Databases and Search Terms

Web of Science (n=77)

Last Checked: 05/07/2023

Keywords: health OR healthcare OR "health care" OR medical OR dental OR wellness OR spa (Topic) and tourism (Topic) and supply chain (Topic)

Scopus (n=149)

Last Checked: 05/07/2023

Keywords: (TITLE-ABS-KEY (health OR healthcare OR "health care" OR medical OR dental OR wellness OR spa) AND TITLE-ABS-KEY (tourism) AND TITLE-ABS-KEY (supply AND chain))

PubMed (n=40)

Last Checked: 05/07/2023

Keywords: ((health OR healthcare OR "health care" OR medical OR dental OR wellness OR spa) AND (tourism)) AND (supply chain)

ProQuest (n=95)

Last Checked: 05/07/2023

Keywords: noft(health OR healthcare OR "health care" OR medical OR dental OR wellness OR spa) AND noft(tourism) AND noft(supply chain)

EBSCO (n=147)

Last Checked: 05/07/2023

Keywords: AB (health OR healthcare OR "health care" OR medical OR dental OR wellness OR spa) AND AB tourism AND AB supply chain

Appendix 2. Research Strategy

Databases and Search Engines: Web of Science; Scopus; PubMed; ProQuest; EBSCO

Keywords: (health OR healthcare OR "health care" OR medical OR dental OR wellness OR spa) AND (tourism) AND (supply chain)

Inclusion Criteria

- *No time exception*

Exclusion Criteria

- Language criteria (only English)
- Articles and conference proceedings
- The medical tourism supply chain or any associated context

Research Steps:

1. Each researcher will independently search databases and search engines with the identified words.
2. All data will be pooled at Endnote and organized by researchers.
3. Elimination steps. *
4. The researchers will blindly assess the title, abstracts, and keywords of the studies from the databases and code them as 0-1 in a Microsoft Excel file. Zero, meaning do not include the study, and One is to have the study. **
5. Researchers will discuss studies coded 0-1 with the supervisor and decide which studies will be included in the full-text review.
6. Full-text review. (Inclusion criteria)
7. After the full-text review, the researchers will reconvene with a supervisor and decide on the studies to be included in the systematic review.
8. Visualizing
9. Writing the Original Draft

**** Elimination Steps:***

1. **Study type:** Book (n=10) + Book Section (n=27) + Generic (n=40) + Thesis (n=12) + Conference Proceedings (n=17) + Editorial (n=2) = Total (108)
2. **Duplicates:** Automation tools (Endnote) (n=157). Manually (n=19)
3. **Language**: (n=14)

***** Screening:***

- Are studies still not meeting the language and document type criteria?
- Are there still duplicate studies? If there are such studies, they should be marked or noted so they can be removed later.
- In the screening phase, whether the study was conducted in the health tourism supply chain or on a related topic will be examined. If the study is relevant, it will be coded with 1 in the table in the Excel file; if not, it will be coded with 0.