

Original Article

The Development of Medical Tourism Related to Assisted Reproduction Technology (ART) Methods Worldwide and its Growth Perspectives in Cyprus: A Systematic Review

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Abstract

Introduction-Background: Medical tourism constitutes a rising sector of the tourism industry, as several countries around the world are welcoming thousands of tourists daily who visit them in order to receive medical services, usually combining them with short-term holidays. Infertility and other diseases affecting conception cause a large number of couples to resort to the resolution of assisted reproduction. Assisted Reproductive Technologies (ART) is an important means of tackling infertility and other conditions that prevent young couples from conceiving. The aim of this paper is to investigate the development of medical tourism related to assisted reproduction technology (ART) methods worldwide and its growth perspectives (future prospects and trends for sustainable development and investments) in Cyprus.

Methods: A systematic literature review was conducted on September - October 2017. The search was conducted in the PubMed and Google Scholar databases using as keywords medical tourism, assisted reproductive technology, medical tourism and assisted reproductive technology in Cyprus, etc. The inclusion criteria were articles/studies published from 2009-2017, Cyprus as the country of medical tourism destination, studies published in English and Greek and in acknowledged scientific journals and inclusion of certain types of studies (reviews, surveys, observational studies, case studies, cross-sectional studies and qualitative studies).

Results: Initially 508 papers from the above-mentioned databases were identified. Of the 508, 90 were rejected after reading the title (duplicate entries or they had no summary or were not written in the language of choice), 178 were rejected after reading the summary (they were conducted before 2009) and 172 were rejected because they did not refer to the assisted reproductive tourism as a branch of the medical tourism. Of the remaining 68, 46 were rejected after studying the entire text as they did not again address the subject under study. The studies included in the review unraveled several factors that define the development of medical tourism related to assisted reproduction technology (ART) methods worldwide (e.g. demographic changes i.e. the aging population, the high cost of treatment in the high-income origin countries and the respective long waiting lists, the changes in the family structure and other economic, social, political, religious and legal constraints, etc) and highlighted the prominent growth opportunities for the Cypriot context.

Conclusions: Medical tourism related to assisted reproduction technology (ART) methods is dynamically growing and countries like Cyprus has the potential to succeed in expanding its economy by investing in medical equipment, investments in healthcare facilities and the synergy between public and private ventures.

Keywords: medical tourism, assisted reproductive technology, medical tourism and assisted reproductive technology in Cyprus

Introduction-Background

Medical tourism constitutes a rising sector of the tourism industry, as several countries around the world are welcoming thousands of tourists daily who visit them in order to receive medical services, usually combining them with short-term holidays. Many countries in Europe such as Denmark, Norway, Sweden, etc. but also on a global scale such as India, China and Russia have increased their income from this type of tourism (Banerjee et al., 2018). Cross-border medical tourism occurs when individuals decide to receive healthcare in a different country from their country of residence at their own expense and is a growing global phenomenon. Patients are mainly looking for medical care for plastic, dental and ophthalmologic health services and procedures, but the number of patients moving for transplants, orthopedic surgeries or fertility treatments is rapidly increasing (Yildiz & Khan, 2016).

Infertility and other diseases affecting conception cause a large number of couples to resort to the resolution of assisted reproduction (Mascarenhas et al., 2012). Assisted Reproductive Technologies (ART) is an important means of tackling infertility and other conditions that prevent young couples from conceiving. In particular, it is estimated that at least about 20,000 to 25,000 pairs are subjected to in vitro fertilization (IVF) treatment abroad every year. Under normal circumstances, assisted reproduction techniques are reported in the national registries and data are reported to the European Society of Human Reproduction and Embryology (ESHRE) for the compilation of the European in vitro fertilization database. However, interventions carried out abroad are rarely included in these databases and are therefore not recorded (Bergmann, 2011).

Patients look for assisted reproduction-fertility medical services in a different country for various reasons. The high cost of services provided in the countries of origin of patients and the low cost and very competitive prices of the provided medical services (affordability) in the destination countries (Gray & Poland, 2008; Crone, 2008; García-Altés, 2005) constitute one of the most common reasons that lead patients to explore treatments abroad. In some countries, all related costs have to be covered by the patient, while in others, not only the treatment, but also the costs of the medical care have to be covered

by the patient as well (Yildiz & Khan, 2016). Decreased accessibility to health services, i.e. long waiting lists, especially in the public hospitals of the developed countries (USA, Western Europe), force health travelers to resort abroad (García-Altés, 2005; Leahy, 2008; Vastag, 2008). As assisted reproduction technology (ART) treatments are guided by rules in most European countries, the legal framework within which ART can be applied to a particular country varies considerably. In some countries, the number of embryos that can be fertilized is limited (e.g. Italy), the number of embryos selected for implantation is limited (e.g. Germany) or the number of embryos that can be implanted is regulated (e.g. Scandinavian countries). In addition, some interventions (pre-implantation genetic testing, surrogate motherhood or gender selection) may be allowed in some, but not all, European countries (Hughes et al., 2016; Glinos, Beaten & Boffin, 2008; Smith & Forgione, 2007). Additionally, various religious and socio-political reasons that prevent treatment in the country of origin (e.g. artificial insemination) (Connell, 2006) and demographic changes, increased life expectancy, level of education and patients' expectations (which translate into greater needs for medical care and pressure on available health care resources) seem to contribute significantly to the individuals' decisions to travel abroad for medical reasons.

Finally, specific characteristics of the destination country seem to highly influence patients' choice for assisted reproduction medical services, i.e. the quality of health services in terms of the use of modern medical technology, the increasing amount of private healthcare providers and modern setting up, the experienced medical and nursing staff (Gray & Poland, 2008), the ability to treat, recover and relax in exceptional circumstances (high quality services that are accompanied by modern technology, hospitality, personal care and luxury hotel services) (Goodrich, 1993; Mudur 2004), the international accreditation for infrastructure and quality of care of the assisted reproduction clinics (Burkett, 2007), the political stability of the destination country in terms of protecting travelers in matters of personal safety (Crooks et al., 2010; Kangas, 2007; Smith & Forgione, 2007) and allowing the country to respond and adapt easily and quickly to the patients' needs (Snyder et al., 2011) and the ability to use a common language with the

medical staff in the destination country (Burkett, 2007; Saniotis, 2007; Sen Gupta, 2008).

The **aim** of this paper is to investigate the development of medical tourism related to assisted reproduction technology (ART) methods worldwide and its growth perspectives (future prospects and trends for sustainable development and investments) in Cyprus.

Methods

A systematic literature review was conducted from September 2017 to October 2017. The search was conducted in the PubMed and Scholar online databases using the following keywords (QUERY): (Medical Tourism or Assisted reproductive technology or Medical tourism in Cyprus or Assisted reproductive technology in Cyprus or Medical Tourism and Assisted reproductive technology or Medical Tourism and Assisted reproductive technology in Cyprus).

Inclusion criteria

The inclusion criteria were (a) articles/studies published from 2009 to 2017 (in order to avoid introducing conflicting results due to the economic crisis impact; thus the selected studies refer to the time period following the economic crisis - a transitional phase for Cyprus - in order to better pinpoint the contribution that medical tourism and especially the assisted reproductive tourism can add as a basis for the development of tourism and the economy), b) Cyprus as the country of medical tourism destination (there were no restrictions for the country of origin), c) studies published in English and Greek and in acknowledged scientific journals and d) inclusion of certain types of studies (reviews, field surveys, observational studies, case studies, cross-sectional studies and qualitative studies).

Through a systematic and extensive review and study of the literature, the main characteristics of the studies i.e. author's name and year, country, study sample, aim of the study, type of study and main findings were recorded, so that they can be compared and included in this review.

Study Limitations

The limited time scope of the review and the inclusion of certain types of studies (reviews, field surveys, observational studies, case studies, cross-sectional studies and qualitative studies) should be taken into consideration as the main methodological weaknesses of the study.

Results

The following flow diagram (Figure 1) illustrates the steps followed for the purposes of this review. Initially 508 searches/papers from the above-mentioned databases were identified. Of the 508, 90 were rejected after reading the title because they were duplicate entries or they had no summary or were not written in the language of choice. Of the remaining 418, 178 were rejected after reading the summary because they were conducted before 2009 and 172 were rejected because they did not refer to the assisted reproductive tourism as a branch of the medical tourism. Of the remaining 68, 46 were rejected after studying the entire text as they did not again address the subject under study.

Table 1 provides information on the 22 studies that investigated the development of medical tourism related to assisted reproduction technology (ART) methods worldwide and its growth perspectives (future prospects and trends for sustainable development and investments) in Cyprus.

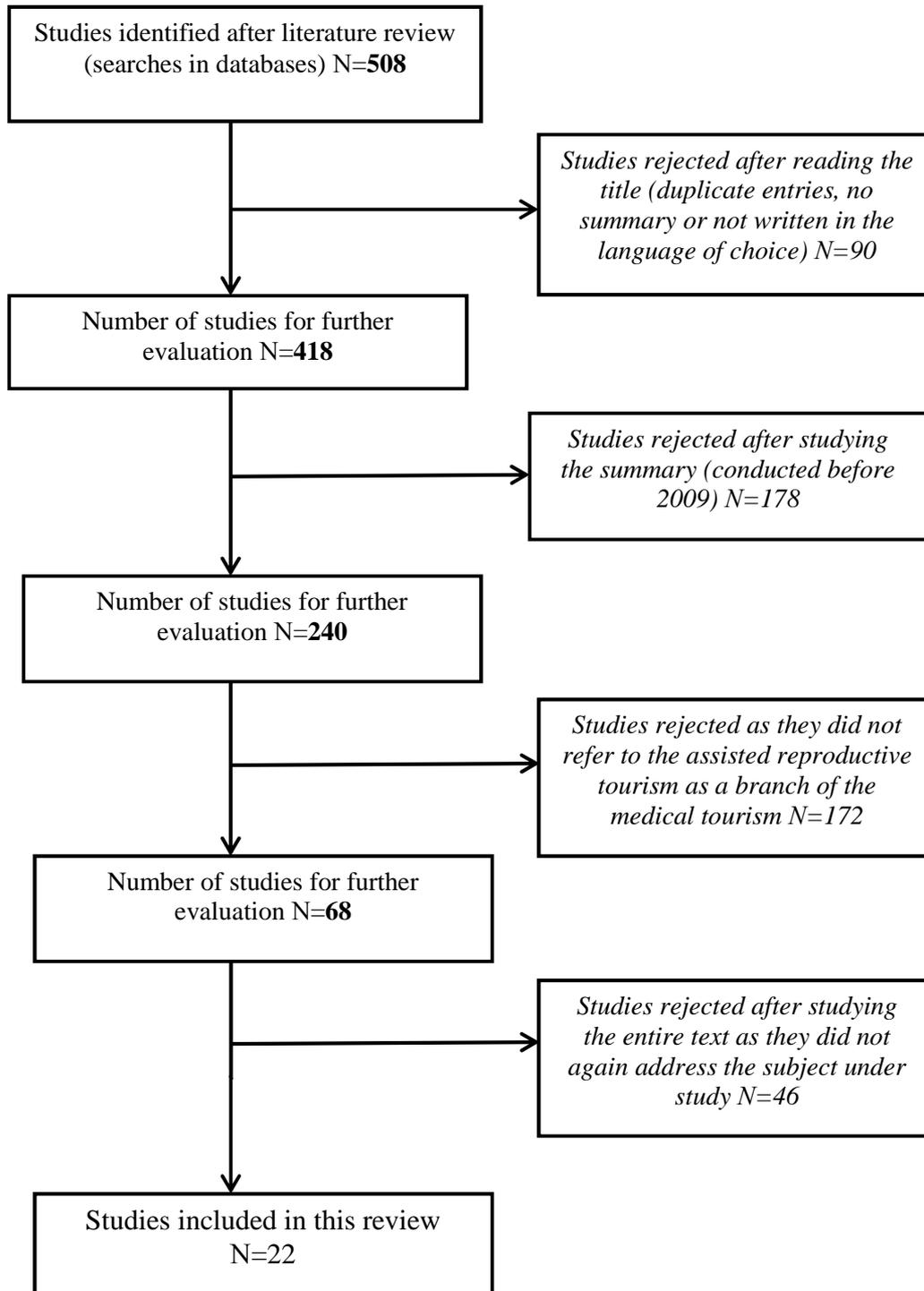
Development of Medical and Assisted Reproductive-Fertility Tourism

A study among 109 countries during 2012-2014 (Esiyok, Cakar & Kurulmusoglu, 2017) showed that the continuing rise in medical tourism in recent years is mainly due to the high cost of treatment in the rich countries of the world, due to long waiting lists (as such interventions are not always considered a priority), due to the relative affordability of the international air travel, due to favorable economic exchange rates and due to the aging of the often wealthy post-war generation. As a result, the old pattern of rich patients traveling to rich global centers abroad has been reversed. Growth in medical tourism has also been facilitated by the increased Internet use and the emergence of new non-healthcare mediating providers between international patients and hospital networks (Han & Hyun, 2015), but also due to the rapid improvement of some key countries' health systems where new technologies have been adopted. For example, in India, the websites of the medical institutions constitute a powerful lever for the development of medical tourism (Moghavvemi et al., 2017). The continuing development of medical tourism coupled with the strengthening of developing countries in this area have transformed Internet use to a key means of developing and strengthening this type

of market and the needs of health tourists worldwide. However, it is imperative for hospital

managers to improve their hospital online presence and interactivity.

Figure 1. Flow diagram of the review



Considering the increasing competition in the medical tourism market and especially in developing countries (e.g. in Malaysia), countries are trying to define their own specialties in order to create a differentiation and fragmentation of the medical market (Seow et al., 2017). Snyder et al. (2017) state that differences between developed and developing countries (with reference to Canada) are often created by the provision of specialized healthcare services, the services in which countries have a significant comparative advantage. Investing in these narrowly defined specializations allows countries to become known as the preferred destination for these services. Kesar and Mikulic (2017) referred to specific examples such as those of Poland and Hungary, which have been focusing on dental tourism, a special form of medical tourism as health tourists choose more affordable destinations to get dental work. According to the authors, identifying a destination as the preferred one can now be based on the provision of specialized health care services. This process in this area creates a "reputation-outcome" relationship, which can be a catalyst for achieving higher demand in the market and for other medical services as well. Some countries have also benefited from their special status as centers of a particular religion and have been recognized as medical tourism destinations for people of this particular religious identity. For example, Iran and Lebanon have become destinations for a significant number of Semitic populations, and Israel attracts many Jews from around the world (Inhorn, 2011).

Often, placing focus on a particular treatment may transform a destination country into a travel center for its regional countries with relatively low quality of health care. For example, accredited hospitals in Jordan and Turkey have specialized in ultra-modern cancer therapies and have attracted patients from neighboring countries. Similarly, Indian hospitals have become known for the diagnosis and treatment of cardiovascular diseases while Argentina specializes in eye surgery and Malta has become a destination country for hip and knee replacement (Bookman & Bookman, 2007; Pizaolo & Zanca-Albayrak, 2011; Yidiz & Khan, 2016). The ability of destination countries to use trained medical professions, modern technology and scientifically recognized methods also attracts medical tourists. Once a country is known to provide specific medical services,

economies of scale enable it to gain an even greater market share.

The modern concept of the "well-being" has evolved more than ever in recent decades as improving health during holidays is no longer just an expected consequence of escaping from hard work and moving to a place with a warmer climate but in some cases, it has become a central attraction for medical tourism in an active rather than passive sense (Garcia-Altes, 2005). However, a major barrier that medical tourism faces and continues to face is the challenge to persuade potential health visitors/tourists that medical care in relatively poor countries is comparable to the one they have experienced in their country, in terms of outcome, safety and even of pain treatment (Abadi et al., 2018). This was particularly true when healthcare systems in countries like India were traditionally considered to be inadequate in the West, even in India as well.

Europe currently provides a wide range of ART therapies, however there are large fluctuations in the use of assisted reproductive treatment among European countries; Denmark, Belgium, Iceland, Sweden and Slovenia have the largest percentage of assisted reproductive treatment use (Kupka et al., 2014). In 2012, the last year for which global data are available, 56% of ART therapies took place in Europe, followed by Asia (23%) and North America (15%) (Zegers-Hochschild et al., 2014). Given that many European countries have been classified as areas with the lowest fertility rates, ART is sometimes not only a key treatment for having children, but also a key technique for enhancing fertility rates in Europe (Kohler et al., 2012). As a result, the interest in ART has increased and constitutes a key solution to address the issue of infertility effectively. Another key parameter for ART in Europe is its strong differentiation at both recruitment and regulatory level depending on the country. From a legislative point of view, Europe is the only continent where ART legislation is widespread. Other countries where ART is not unusual, such as India, Japan and the US, rely heavily on voluntary initiatives. ART's regulation is sometimes portrayed as a new phenomenon, while the general view of governments involved in the reproductive process is related to other important events of the everyday life such as marriage, divorce, contraception, adoption and abortion (Spar, 2005).

In general, there is a tendency for a more rigorous regulation of ART worldwide. Nearly all countries have adopted a rigorous legal framework and strict legislation so as to better monitor these procedures. During 1997 - 2012, laws and other regulations were developed regarding this issue, as over the course of these 15 years, its operating and managing context was defined (EIM et al, 2016). In fact, access to ART has been determined by the shaping of the social being. Social engineering defines how this context is shaped and how it evolves at a societal level. Also, the new data regarding gender relations constitutes a new social phenomenon. In particular, single mothers, unmarried couples, gay couples etc, comprise new forms of relationships but also new forms of family that can, through access to ART, have children and take up their up-bringing (Kupka et al., 2014).

Although reproduction assumes the individuals' choice, state actors have long intervened in shaping their citizens' reproductive choices through regulations, incentives, technologies and services (Martin, 2009). In Europe, the reasons why people seek reproductive therapies outside their national borders are quite different, partly because regulations vary widely between countries (Bergmann, 2011). Compared to other areas of medical tourism, which are being discussed as a consequence of the neoliberal health policy and international medical competition, mobility in the field of reproductive technologies is deeply rooted in new forms of affinity. For example, in the Middle East countries, sterile couples often dream of bringing a "test tube baby" back home for various cultural, moral and psychological reasons (Inhorn, 2011). These reasons are rarely highlighted in the scientific literature on cross-border reproductive care, and therefore further empirical research is needed to assess the additional reasons for reproductive travel across Europe-America. However, Turkey is a major player in this market due to the relatively better quality of service and the large comparative cost advantage and it seems that both cost and quality are the two most important factors affecting the demand for healthcare services by international patients in Turkey (Yildiz & Khan, 2016). Quality, cost and success indicators/rates in Turkish hospitals were found to be higher than those in US hospitals, and the cost-effectiveness of the IVF treatment per successful clinical

pregnancy was much lower in Turkey than in the US.

Regarding assisted reproduction technology metrics, among 30 European countries that provided data in 2010 and 2011 (Kupka et al., 2014; Martin et al., 2015), the number of IVF and ICSI cycles (Intraoral Sperm Injection) increased from 407,675 to 433,395 (6.3%). Registries from some countries have been unable to provide data on reproduction cycles and number of births. In addition, many countries have a high rate of pregnancies lost for follow-up. Therefore, full data were only available for the pregnancy rates per treatment, while some of the most reliable success rates of treatment (clinical pregnancies and births per starting cycle) cannot be fully reported and the comparison of countries should be done with caution. Also, and although cross-border reproductive care is a key component of the assisted reproductive technology in North America (3% -10% of fertilization cycles are provided to outpatients in Canada and the US), clinicians are not encouraged to collect data about patients receiving cross-border reproductive care services. Therefore, reliable data is needed to better understand the causes and effects of providing cross-border reproductive care (Hughes et al., 2016).

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Studies in this category were few, indicative of the fact that medical tourism has not developed to a satisfactory level in Cyprus. According to Ozturen, Gursoy and Kilc (2017), within the context of the development of hospitality services on the island, investments in infrastructure have been made as well as further actions aiming to improve the island's competitiveness in the tourist industry. In this context, investments are made in hospitals and health facilities in order to enable the island to improve its hospitality dynamics and, above all, the provision of medical services. This dynamic can help the island focus on new market segments, thereby achieving higher demand and profitability in the industry. According to Lunt et al. (2013), Cyprus is among the countries that make use of their potential at a tourism level, due to their culture and history that connects it with other countries that had previously developed a particular relationship. For example, Cyprus is benefiting from its relations with Great Britain,

as it was in the past under its sovereignty. The connection between the two countries is strong, making Cyprus a destination country accustomed and relevant to their demands. British trust destinations such as Cyprus so Cyprus could focus on UK in order to promote its medical services.

One of the most comprehensive and relevant studies on medical tourism in Cyprus is that of Andreou et al. (2017). The authors highlight the fact that in order for Cyprus to develop its medical tourism, it should invest in medical facilities and in the interaction and synergy of the public and private sector in order to provide better health services, with the government's active involvement in terms of the development of an appropriate and efficient financial and organizational context. The study concludes that medical tourism in Cyprus shows great potential for development but also for its establishment as a key alternative destination for health tourists. In fact, medical tourism could constitute an important pillar for the development of its economy.

Also, according to the official organization Fertility Clinics Abroad, in a survey conducted in all EU countries (Fertility Clinics Abroad, 2017), Cyprus was found to be among the most popular destinations regarding assisted medical tourism. However, a major obstacle constitutes the fact that the island is divided into the North and South section, so each region approaches this type of tourism differently, given its different culture and legal framework. Specifically in the South section, gender selection is allowed, but not in the North section. Nevertheless, the easy access for the UK citizens, makes the country an ideal destination for the British health tourists. In fact, the study showed that costs amount at a reasonable level, compared to other EU countries (at about €4,500 per treatment).

Furthermore, Cyprus has a strong growth potential in in-vitro fertilization among 55 countries, as it comprises a “friendly” legal framework in this area and has relevant infrastructures that are constantly improving, as well as the scientific staff that is able to support the relevant treatments (Ishihara et al., 2015). In fact, Cyprus is dynamically growing in IVF, providing the opportunity in the future to boost its tourism economy in general and reproductive tourism in particular. Of course, Cyprus has not yet shown its full potential in this type of

tourism, but it has the required guarantees given the quality of services it can provide, and competitive prices as well (De Mouzon et al., 2010). Although Cyprus has managed to successfully emerge from the economic crisis, it should continue to make development efforts (such as investing in medical tourism), which may in fact limit the likelihood that something similar will happen again in the future (Boukas and Ziakas, 2013).

Discussion

This review focused on the investigation of the development of medical tourism related to assisted reproduction technology (ART) methods worldwide and its growth perspectives (future prospects and trends for sustainable development and investments) in Cyprus.

Worldwide, over the last decades, medical tourism has increasingly developed in the majority of countries. The causal factors are mainly the high cost of treatment in the high-income origin countries, the presence of long waiting lists, the aging population and the much more affordable opportunities to travel abroad (Esiyok, Cakar & Kurulumusoglu, 2017). Also, the expansion of internet use (Han & Hyun, 2015; Moghavvemi et al., 2017) and the emerging opportunities in the market placing (e.g. specialization in the provided healthcare services) (Seow et al., 2017; Snyder et al., 2017; Kesar & Mikulic, 2017) constitute additional factors that contribute to the development of medical tourism in all countries. However, awareness about hospital online presence and interactivity among hospital managers in order to improve medical tourism in developing countries is needed (Moghavvemi et al., 2017).

Assisted reproductive tourism is, in the recent years and currently, on the rise, and as a result a large proportion of couples are receiving fertility treatment through assisted reproductive technology (ART). Europe currently provides a wide range of ART therapies, however there are large fluctuations in the use of assisted reproductive treatment among European countries; Denmark, Belgium, Iceland, Sweden and Slovenia have the largest percentage of assisted reproductive treatment use (Kupka et al., 2014).

The existing national policies enable modifications regarding medical tourism related to assisted reproduction methods, in the majority

of countries. In particular, differences among countries in terms of country regulations about assisted reproduction methods constitute the major reason for seeking such opportunities in other countries throughout Europe (Martin, 2009; Bergmann, 2011). Economic frustrations and cultural distinctions constitute major problems of access in medical reproductive tourism in other countries and further empirical investigation is needed in order to assess additional reasons for reproductive travel among countries (Inhorn, 2011).

Regarding the development of medical and assisted reproductive-fertility tourism in Cyprus, the review of the literature unraveled the lack of studies investigating medical tourism and assisted reproductive technology in Cyprus (Andreou et al., 2017). However, according to other studies, the quality of provided medical services in Cyprus can constitute a valuable ally towards promoting medical tourism in the country, within the context of the development of ART (De Mouzon et al., 2010). In particular, Cyprus can be characterized as a quite promising country with large opportunities in developing medical tourism related to assisted reproductive technology (Lunt et al., 2013; Ishihara et al., 2015; Calhaz-Jorge et al., 2016). Therefore, investments in medical equipment, further investments in healthcare facilities and increase in the related scientific knowledge can promote this type of tourism in Cyprus (Andreou et al., 2017). In fact, a large number of UK citizens trust the quality of the provided medical services in Cyprus (Lunt et al., 2013), a positive perspective that the country may benefit from, as well as from the potential of an active participation of the government through the synergy between public and private ventures (Andreou et al., 2017).

Conclusions

Given the demographic changes, the worldwide aging population, the changes in the family structure and other economic, social, political, religious and legal factors that continually diversify the market of medical tourism related to assisted reproduction technology (ART) methods, this market will increasingly grow by providing additional opportunities of development in the countries that will claim its share in the coming years. Medical tourism related to assisted reproduction technology (ART) methods is dynamically growing and

countries like Cyprus has the potential to succeed in expanding its economy by investing in medical equipment, investments in healthcare facilities and the synergy between public and private ventures.

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Table 1. Studies' characteristics

<i>Author, year</i>	<i>Country</i>	<i>Study Sample</i>	<i>Aim of study</i>	<i>Type of study</i>	<i>Main findings</i>
Esiyok et al. 2017	Turkey	Data about medical tourism in 109 countries between 2012-2014	Investigation of relationships between the origin countries of international patients and their cultural distance from the destination country in terms of medical tourism	Review	Medical tourism has been developed dramatically due to the high cost of treatment in the high-income countries, presence of waiting lists, aging and more easily travelling
Han and Hyun 2015	Korea	309 participants (20-65 years old)	Interpretation of international medical travelers' intention formation by considering the impact of quality, satisfaction, trust, and price reasonableness in the context of model development	Cross-sectional	Development of internet facilities and technological achievements in healthcare led to the increment of medical tourism over the last years.
Seow et al. 2017	Malaysia	380 participants	Investigation of extended model of the Theory of Planned Behavior in predicting tourists' intention in seeking medical tourism	Observational	Increased competition in tourist market lead to distortion of perceived benefits and perceived costs related to costumers' attitude. Moreover, resource availability is significantly related to the intention for medical tourism.
Moghavvemi et al. 2017	Malaysia	51 hospitals(India, Malaysia, Thailand)	Investigation about websites of private hospitals promoting medical tourism in 3 Asian countries so as to examine how these hospitals present themselves online and appeal the perceived needs of medical tourists	Observational	Development of medical tourism constitutes principle of promoting internet facilities. Moreover, there is need for hospital managers to improve their hospital online presence and interactivity.
Snyder et al. 2017	Canada	22 physicians	Investigation of ways by which Canadian family doctors' typical involvement in patients' informed decision-making is challenged when their patients engage in medical tourism	Exploratory qualitative study	There is confusion and tensions related to the regular domestic physician's role in decision-making. Provision of specialized healthcare services constitutes the main difference of the provision of medical tourism between developing and developed countries.
Kesar and Mikulic 2017	Zagreb	253 dental patients in a dental clinic located	Interpret key attributes of foreign patients' satisfaction and dissatisfaction about received dental care services.	Exploratory case study	The specialization in the provided dental services constitutes the principal reason for the development of specialized medical tourism in such countries.
Yidiz and Khan 2016	Turkey	Turkey data from a hospital specializing in IVF services and USA data from secondary sources	Comparison of cost, quality and effectiveness about in-vitro fertilization (IVF) in USA and Turkey	Observational	Study focus on a specific medical treatment in some countries constitutes the major reason of highlighting such countries about provision of special medical tourism.

Abadi et al. 2018	Iran	Data about medical tourism industry in Yazd province of Iran	Interpretation of a strategic planning framework for development of medical tourism industry	Review	The major challenge of medical tourism is to make people convinced about the quality of provided medical tourism facilities in poor-income countries.
Kupka et al. 2014	Belgium	991 clinics reported 550 296 ART treatment cycles	Report about European data on treatments with assisted reproductive technology (ART) and intrauterine insemination (IUI)	Retrospective	There are large fluctuations in the use of assisted reproductive treatment among European countries. Denmark, Belgium, Iceland, Sweden and Slovenia have the largest percentage of assisted reproductive treatment use.
EIM et al. 2016	Belgium	1,064 clinics reported 609,973 ART treatment cycles by 33 countries	Report about European data on treatments with assisted reproductive technology (ART)	Retrospective	There are strict law adjustments about the provision of ART treatment in all countries, in order to achieve procedure control.
Lunt et al. 2013	UK	Data about medical Tourism	Discuss principles of medical tourism	Review	Cyprus can be characterized as a country with high level of tourism, which can lead to medical tourism development. A large number of UK citizens trust the quality of the provided medical services in Cyprus.
Andreou et al. 2017	Cyprus	22 individuals related to medical tourism in Cyprus	Investigation of the current state of affairs and perspectives pertaining to medical tourism in Cyprus	Observational	There is need of further investments in healthcare facilities and medical equipment, in order to promote medical tourism in Cyprus. Moreover, the active participation of the government through public-private ventures can lead to the development of medical tourism.
Boukas and Ziakas 2013	Cyprus	8 semi-structured interviews with tourism authorities and suppliers/professionals	Investigate impacts of the global economic crisis on Cyprus tourism	Qualitative	There is need for further improvement in medical tourism investments due to the previously occurred economic crisis in Cyprus.
De Mouzon et al. 2010	Belgium	998 clinics reported 458 759 treatment cycles (33 countries)	Report about European data on treatments with assisted reproductive technology (ART)	Retrospective	Quality of provided medical services in Cyprus can be an essential tool in the effort to promote medical tourism in this country in the context of ART.
Ishihara et al. 2015	Japan	1,251,881 procedures with ART	Interpret informed analyze on assisted reproductive technology (ART) performed worldwide	Cross-sectional	Cyprus can be characterized as a quite promising country with large opportunities in developing medical tourism related to assisted reproductive technology.
Calhaz-Jorge et al. 2016	Belgium	1111 clinics reported 640 144 treatment cycles (34 countries)	Report about European data on treatments with assisted reproductive technology (ART)	Retrospective	Cyprus can be a country with large tourism related to assisted reproductive technology in the future.

Martin 2009	USA	Published studies	Investigate tensions between national regulations and the global marketplace for assisted fertility services	Review	National policies and country regulations constitute major factors of modifying medical tourism related to assisted reproduction methods in the majority of countries
Bergmann 2011	USA	Published studies about medical tourism related to assisted reproduction methods in Spain, Denmark, Czech Republic	Investigate reasons about searching opportunities of medical tourism related to assisted reproduction methods	Qualitative	Differences among countries regarding national policies and country regulations about assisted reproduction methods constitute the major reason for searching such opportunities of medical tourism in other countries throughout Europe.
Inhorn 2011	USA	Ethnographic studies published in 4 Middle Eastern countries (Egypt, Lebanon, United Arab Emirates and Arab America)	Investigate dynamics of return reproductive tourism to the Middle East	Review	Further empirical investigation is needed in order to assess additional reasons for reproductive travel beyond Euro-America. Economic frustrations and cultural distinctions constitute major problems of access in medical reproductive tourism in other countries.
Hughes et al. 2016	USA	32 Canadian and 440 USA clinics	Collect additional specific information about Cross border reproductive care (CBRC) in North America	Cross-sectional	Although CBRC is a major factor of assisted reproductive technology in North America, practitioners are not motivated to collect the simplest of data regarding CBRC patients
Yidiz and Khan 2017	Turkey	Turkey data from a hospital specializing in IVF services and USA data from secondary sources	Comparison of cost, quality and effectiveness about in-vitro fertilization (IVF) in USA and Turkey	Observational	Cost-effectiveness ratio of IVF treatment per successful clinical pregnancy was much lower in Turkey than in the USA. Therefore, the cost and quality constitute the two most important factors affecting demand for health care services by international patients in Turkey.
Martin et al. 2015	Spain	2,570 samples	Develop an expanded pan-ethnic preconception carrier genetic screening test for use in assisted reproductive technology (ART) patients and donors.	Retrospective	Genetic screening test combined with matching system and genetic counseling, constitutes a powerful tool to avoid mendelian diseases in the offspring of patients undergoing ART.