

Original Article

The Involvement of in Vitro Fertilization in the Development of Medical Tourism in Greece: Study of the Cost and Quality of Services Offered in Comparison with other Countries

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Abstract

Objective: The study examines the factors of cost and quality of assisted reproduction services in Greece in comparison with international data and evaluates the benefits that both patients and the health system of our country have.

Method: The methodology used included, first, a bibliographic review of available sources and, second, the research study through the distribution of questionnaires to patients seeking services in the field of assisted reproductive technologies (ART). This questionnaire included 22 questions and the collection of statistical data was done through a sample survey because the sample was easy to collect. The survey was conducted from November 2021 to March 2022, and the number of completed questionnaires was 417.

Results: The results of the survey confirmed the importance of high-quality services in health care facilities (73.7%) combined with significantly low costs (20.1%). However, the cost of ART in Greece is considered high by 76.3% of respondents. However, the correlation between country of permanent residence and cost perception ($p=0.000 < 0.05$) showed that women with permanent residence in Greece perceived the cost of ART services as high by 81.1%, while most women with permanent residence abroad (53.5%) perceived it as moderate. Our country was chosen as a destination for assisted reproduction because of its accessibility (33.6%), while Greek in vitro fertilization (IVF) clinics/facilities were chosen due to their health facilities and attending physicians (54.1%). In addition, the need for post-treatment accommodation led to a request for additional services.

Conclusions: Greece is considered a popular destination for reproductive tourism. However, it needs to be further promoted, as the main sources of information are medical professionals (43.7%) and social circles (41%). Nevertheless, 90.5% of respondents agree with the recommendation for Greece as a destination for reproductive tourism.

Key Words: medical tourism, assisted reproduction, reproductive tourism, Greece, in vitro fertilization (IVF)

Introduction

Improvements in medical technology, capital financing, and regulation in recent decades have led to new patterns of consumption and production of health care services. Medical care is primarily a tradable service, leading patients to seek health care services with new standards, a phenomenon referred to as medical tourism (Lunt et al., 2011). In the past, patients moved from country to country primarily to seek diagnostic and therapeutic services that were not available in their country of origin, resulting in patient flows from developing to developed

countries (Paffhausen, Peguero, Roche-Villarreal, 2010). Meanwhile, demographic, social, and economic changes in the population, as well as limitations in the health care system of developed countries, have led to a reversal of this flow, and much of the medical tourism takes place in developing countries (Kesar & Rimal, 2011). By traveling across borders and receiving medical services in selected destination countries, patients can significantly reduce waiting times and costs, among other benefits, while receiving equivalent or higher quality medical care (Daykhes, 2020). Historians have reported that the beginnings of

medical tourism are in ancient Greece, where people sought healing through thermal baths in temples (Laspa, 2019). The most common categories of medical services that fall under medical tourism include cosmetic/plastic surgery, transplants, dentistry, dermatology, ophthalmology, and assisted reproduction. In particular, the use of assisted reproduction services in a country other than the one in which one resides shows a strong development on a global scale and offers significant economic and social benefits.

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large number of infertile people thanks to the advanced legal framework of our country and the increasing number of facilities for medically assisted reproduction. The latter offer a wide range of fertility services of high quality by qualified personnel and at relatively low cost compared to the corresponding clinics on the market in other countries.

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The demand for medical tourism is influenced by various international, regional and individual variables, given the globalized economic, technological and social environment. The main factors driving the increasing demand for medical services abroad are:

- Cost
- Quality
- Availability of treatments
- Accessibility of the health care system
- Legislation and religious beliefs
- Privacy and confidentiality
- Combination with holidays (Richards & Richards, 2006)

According to European Society of Human Reproduction and Embryology (ESHRE, 2022),

the worldwide need for medically assisted reproduction was estimated to be at least 1500 cycles per million population per year. It appears that Europe is the international leader in IVF, with Spain being by far the most active IVF country in 2017. The organization Fertility Treatment Abroad (Fertility Treatment Aboard, 2022) listed Spain, India, Turkey, Brazil, Ukraine, Greece, Czech Republic, Hungary, Russia, Bulgaria, Lithuania, and Malaysia as the most popular destinations for assisted reproductive treatments.

The cost of Assisted Reproductive Techniques (ART) cannot be accurately determined because it depends on several factors, such as the particular center, the time to achieve pregnancy, the infertility treatment method used, the medications, and the dosages. The countries with the highest costs for in vitro fertilization (IVF) are Italy, the United Kingdom, and Spain, while the lowest costs are observed in Turkey (Paraskou & George, 2017). The cost of one IVF cycle (excluding drugs) in Greece (ESHRE, 2022) is estimated to be between €3,000 and €3,350.

Material and Methodology

The methodology used in the study included a literature review on reproductive tourism and the use of a specially designed questionnaire. The literature review was secondary research from official sources such as articles, studies, books, official organizations, etc. The data collected was related to the analysis of the concepts of medical tourism in general and reproductive tourism in particular, as well as the field of health care and its development in recent years. Data were collected on the existing situation and the factors that discourage or encourage people to seek medical treatment in other countries were sought (Andreou et al., 2019; Torabipour et al., 2017; Yildiz & Khan, 2016; Gleicher, Weghofer, Barad, 2006). The research included data from Greece, but also from international countries that try to promote reproductive and general medical tourism.

The primary data were collected using a questionnaire based on the international and Greek

literature with questions that meet the requirements of the present study. The

questionnaire was chosen because it contains a series of structured questions in which all participants are asked to answer the same corresponding set of questions. The main advantages of questionnaires are that they are less costly, they can be addressed to a large number of people, they are easy to create, distribute and use. In addition, respondents can express themselves freely, as there is no direct communication with another person, the methods of their evaluation are specific and standardized, researchers cannot influence participants' answers, and it is a relatively short method. The questionnaire consists of 22 open and closed questions, in particular dichotomous

questions, questions with graduated scale and multiple-choice questions were used. The content of the questions is divided into demographic questions, socioeconomic questions, and questions about the perception of reproductive tourism. The questionnaire clarifies in an introductory note the purpose of the study, the voluntary nature of participation, the non-commitment to answer all questions, but also the complete anonymity and the exclusive use for research purposes. The questionnaire was available in two languages, Greek and English, and the time required to complete it did not exceed 10 minutes. A sample survey was used to collect the statistical data, as this allowed a faster collection of the results and an easy sampling. The questionnaire was aimed at women and/or couples of domestic and foreign origin seeking and/or receiving services in Greece. It was distributed in printed form in two facilities, one in Thessaloniki and the other in Athens, but also in electronic form through an online form, in organizations and groups of assisted reproductive technologies in social media, to which a large number of infertile people

belong, after consultation with the heads of the units and organizations. The survey took place from November 2021 to March 2022 and the number of completed questionnaires was 417.

Statistical analysis

Data analysis and statistical processing were performed using SPSS v.23. First, the variables were entered into the statistical program and coded by assigning them numerical values and the appropriate groupings so that they could be further processed. The statistical analysis

was divided into two categories: descriptive, in which a concise but effective presentation of the data was made, and inductive, in which the questions on reproductive tourism were related to the demographic and socioeconomic results of the study. For the descriptive data, the categorical or otherwise qualitative variables were analyzed by generating the absolute and relative frequencies (N, %) and the continuous or quantitative and Likert scale variables were analyzed by calculating the mean (Mean), standard deviation (Std. Deviation), median (Median) and range (Minimum & Maximum). The mean and standard deviation are successfully used when the variables are normally distributed. If the distribution is not normal, it is better to estimate the data using the

median and range, because the results are not affected by extreme values. The main normality tests are Kolmogorov-Smirnov (KS), Lilliefors' corrected KS test, and the Shapiro-Wilk test. A limitation of the Kolmogorov-Smirnov test is its sensitivity to outliers, and it has been reported to have low power and should not be seriously considered in normality testing. The Lilliefors correction is used because it makes the KS less conservative. However, the Shapiro-Wilk test is based on correlation of the data, provides better significance than KS and Lilliefors, and is considered the best choice for testing normality of the data. Significance is the most common measure of a test's value for normality, more specifically its ability to determine whether the sample is from a normal distribution (Ghasemi & Zahediasl, 2012). Furthermore, the Shapiro-Wilk test is appropriate for samples of up to 2,000 individuals and is therefore reliable for the present study (Roussos & Tsaoussis, 2011). For continuous variables, normality was tested using the Shapiro-Wilk test and it was found that there was no normal distribution ($p < 0.05$).

Relationships between categorical variables were calculated using Pearson Chi-Square test for independence and Fisher's exact test when necessary, so the results were reliable. Between-group differences in Likert scale continuous variables were calculated with the nonparametric Mann-Whitney and Kruskal-Wallis tests. Statistical significance is indicated by significance, which is referred to in the text as the p value (significance value) along with the statistical index of the respective test (Z for

Mann-Whitney, Pearson Chi-Square for the independence test, and Kruskal-Wallis). Thus, with a significance threshold of 5%, when $p < 0.05$, we have a non-normal distribution for the normality test and statistically significant results for the statistical tests.

Results

Descriptive analysis of demographic data The vast majority of participants are from Greece (90.9%), while 3.4% are from Italy, 1.4% from Cyprus, 1% from Albania, and 0.5% from Ukraine. The remaining participants come from countries such as Bulgaria, France, Germany, Spain, Canada, Romania and Russia. One participant has dual citizenship of Greece and the U.S. 1% of the sample did not provide information on their origin (Table 1). When indicating the year of birth, the average was 1984, with responses ranging from 1969 to 2001 and the largest proportion of 30.3% born between 1986 and 1989. (Table 1)

Descriptive analysis of socioeconomic data

The socioeconomic data of the sample includes the level of education, with 73.1% having a university degree. Occupation: 51.9% of respondents work as private employees, followed by freelancers, civil servants, and unemployed, in that order. Monthly family income, with the largest percentage (39.7%) between 1000 and 2000 €, and insurance company, with 90.9% insured through EFKA. It is noteworthy that 65.4% of the sample is not insured for assisted reproductive (AR) treatments.

Descriptive analysis of perceptions of reproductive tourism

Regarding perceptions of reproductive tourism, it was found that the largest percentage of the sample was informed about the services of AR by medical professionals (43.7%) and by relatives/ friends/ acquaintances (41%). A very small percentage was informed through internet sources. The cost of health care is considered high by the majority of 76.3% of the valid responses of the sample consider that the cost of the services of AR in Greece is high, while 22% consider the cost moderate and only 1.7% consider the cost low. A 0.7% did not answer the question (Fig. 1).

The vast majority of respondents indicated a preference for in vitro fertilization (IVF/ICSI)

(82.7%), followed by egg donation (5.8%). The reasons for choosing the location of the unit were accessibility (33.6%), a popular destination (25.4%), physician (16.1%), and distance from home or work (10.4%). According to the sample responses (Table 2), the choice of units for medically assisted reproduction was based on medical infrastructure and attending physicians (54.1%), followed by quality of services (35.4%) (Table 2). Regarding the results of the Likert scale-based measures, the sample does not consider anonymity important in the use of assisted reproduction (Mdn=2.50), but the quality of the services provided in relation to the use of specialized professionals is very important (Mdn=5). In addition, the location of the practice/unit is moderately important (Mdn=4) and the combination with leave is important to a small extent (Mdn=2). The number of responses given was N=410 (missing=7) for anonymity, N=414 (missing=3) for quality, N=410 (missing=7) for location, and N=414 (missing=3) for vacations. However, a large percentage of 67.4% were not aware of the concept of medical tourism. Nevertheless, slightly less than half (46.4%) intended to travel to another country for medical treatment. In this regard, the most important criteria for choosing a destination are infrastructure and quality of services (73.7%) and, in second place, cost (20.1%), and while at the same time, they consider accommodation in a hotel as an additional desirable service of medical care. Regarding the assessment of whether Greece is suitable for reproductive tourism, it showed that 90.5% would suggest the country as a destination.

Correlation with demographic data

In the correlations of the variables, statistically significant relationships were found with year of birth, permanent residence, education level, occupation, and income. A statistically significant correlation was found between country of permanent residence and cost perception (Pearson chi-square=39.121, $p=0.000 < 0.05$). Specifically, it was found that women who have their permanent residence in Greece perceive the cost of assisted reproduction services in our country as high, with a percentage of 81.1%, while the majority of women who have their permanent residence abroad (53.5%) perceive it as moderate (Table 3).

Table 1. Distribution of samples according to country of origin

Country of origin		Frequency		Valid	Cumulative
		y	Percent	Percent	Percent
Valid	Albania	4	1.0	1.0	1.0
	Bulgaria	1	.2	.2	1.2
	France	1	.2	.2	1.4
	Germany	1	.2	.2	1.7
	Missing	4	1.0	1.0	2.6
	Hellas	379	90.9	90.9	93.5
	Greece, USA	1	.2	.2	93.8
	Spain	1	.2	.2	94.0
	Italy	14	3.4	3.4	97.4
	Canada	1	.2	.2	97.6
	Cyprus	6	1.4	1.4	99.0
	Ukraine	2	.5	.5	99.5
	Romania	1	.2	.2	99.8
	Russia	1	.2	.2	100.0
	Total	417	100.0	100.0	

Figure 1. Distribution of the sample based on the cost of reproductive assistance services

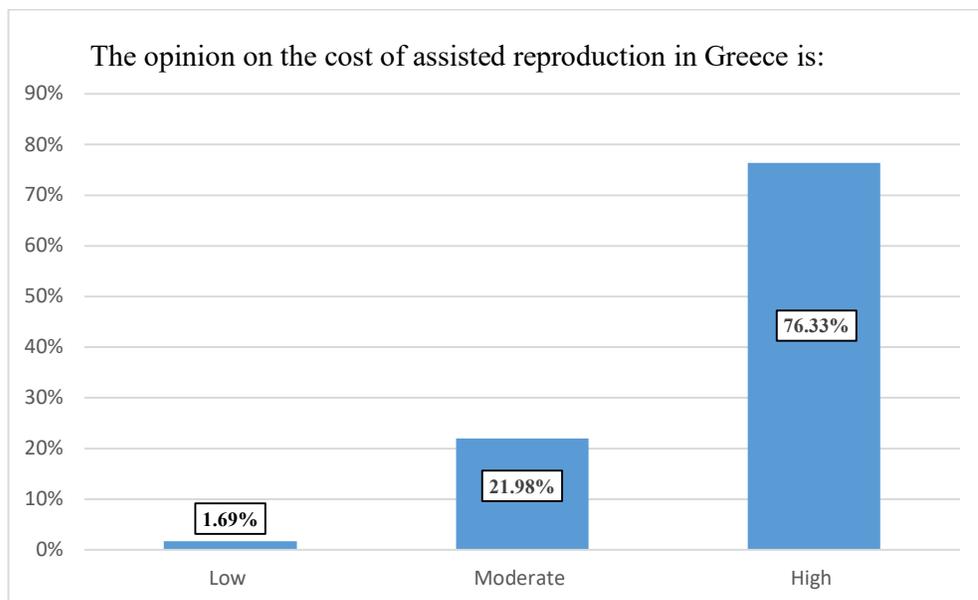


Table 2. Distribution of the sample according to the selection criterion of the assisted reproductive services facility

What was the most important criterion in choosing the assisted reproduction unit?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Medical infrastructure/doctors	222	53.2	54.1	54.1
	Cost of services	23	5.5	5.6	59.8
	Online reviews	16	3.8	3.9	63.7
	Legal framework	4	1.0	1.0	64.6
	Quality of service	145	34.8	35.4	100.0
	Total	410	98.3	100.0	
Missing	-----	7	1.7		
Total		417	100.0		

Table 3: Correlation of permanent residence and costs of assisted reproduction

		Permanent residence (Greece- Foreign)			
		Greece	Foreign	Total	
Cost	Low	Number (n)	4	3	7
		% Cost	57.1%	42.9%	100.0%
		% Permanent residence	1.1%	7.0%	1.7%
		% Total	1.0%	0.7%	1.7%
	Moderate	Number (n)	65	23	88
		% Cost	73.9%	26.1%	100.0%
		% Permanent residence	17.8%	53.5%	21.6%
		% Total	15.9%	5.6%	21.6%
	High	Number (n)	296	17	313
		% Cost	94.6%	5.4%	100.0%
		% Permanent residence	81.1%	39.5%	76.7%
		% Total	72.5%	4.2%	76.7%
Total Values	Number (n)	365	43	408	
	% Cost	89.5%	10.5%	100.0%	
	% Permanent residence	100.0%	100.0%	100.0%	
	% Total	89.5%	10.5%	100.0%	

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	39.121 ^a	2	.000
Likelihood Ratio	32.036	2	.000
Linear-by-Linear Association	38.938	1	.000
N of Valid Cases	408		

a. 1 cell (16.7%) have expected count less than 5. The minimum expected count is .74.

Table 4: Pooled results of the researchers' statistical analysis

Description	Sample	Score – Results
Quality of services/medical infrastructure	206/417	73.7% - Most important criterion for choosing a destination for reproductive tourism
Cost	316/417	76.3% - High for AR services in Greece
In vitro fertilization IVF/ICSI	345/417	82.7% - Preferred ART
Accommodation after the medical service	193/417	67.8% - Additional desired offer in combination with AR services
Recommendation of Greece as a destination for reproductive tourism	373/417	90.5% - Positive consent

Table 5: Overview and comparison with previous studies

	Bartzis et al., 2020	Nikolopoulos, 2015	Kogiou, 2020	Paraskou & George, 2017	Present Study
Medical infrastructure/ Quality of services	High	High	High	High	High
Cost	Low	Moderate	Moderate	Low	High
Accessibility/ Geographical location	Affordable	-	Affordable	Affordable	Affordable
Accommodation after medical care	-	Yes	Yes	-	Yes
Combined with holiday	-	No	Yes (mainly to other nationalities)	Yes	Yes (mainly to other nationalities)

Discussion

The results of the survey show that one of the main factors that seemed to rank high in the implementation of reproductive tourism is cost (Table 4), something that has also been found in previous research (Crooks, Kingsbury, Snyder, 2010; Horowitz & Rosensweig, 2007).

Especially women in Greece consider the cost of AR high, while it is considered moderate by women abroad. The preferred technique for all is IVF, but foreign women also prefer egg donation. It is assumed that these data are directly related to legislation, since the next highest percentage of Greek participants comes from Italy, a country where the legal framework is considered restrictive, especially regarding the donation of genetic material. In addition, the majority of respondents would recommend Greece for assisted reproduction services in the context of medical tourism.

Finally, when assessing the country as a destination for reproductive tourism, it was deemed necessary to consider the factors that would facilitate access to it, both in terms of health services as such and the combined benefits that can be improved to promote reproductive tourism. For example, respondents cited medical infrastructure and the quality of services provided by specialized and qualified personnel as the most important criteria for seeking health services in a country other than the one in which they live. At the same time, in connection with the desired additional health services during their trip abroad, the stay after the medical service was indicated. The above factors are the most fundamental elements for the search, promotion and consolidation of reproductive tourism and it is considered important that Greece has them, but with room for their development.

The bibliographic review identified data from a number of studies, of which the four most

relevant to the present study were selected for optimal comparison. Comparison of the present study with previous studies (Bartzis et al., 2020; Kogiou, 2020; Paraskou & George, 2017; Nikolopoulos, 2015;) on Greece (Table 5) showed that in all studies there was relative agreement in the factors examined, with the exception of cost. There were several variations in costs, as they were classified as low in two studies and moderate in two, while in the present study the majority of

participants classified them as high. It is considered necessary to point out that the high costs refer to Greek women, since those living abroad classified them as moderate, as in the other studies. This is because the majority of the participants in the present survey were Greek women, while the other studies reported a higher percentage of foreign participants.

As for the other results, the importance of quality was rated as high and the geographical location of the facility was indicated as accessible. From the data obtained from the questions on reproductive tourism, it appears that accommodation is most desired after medical care, while the combination with holiday is considered desirable, but mainly by foreigners.(Table 5)

Conclusions: For the further development of reproductive, but also broader medical tourism in Greece,

initiatives should be taken at the national level to cover the costs by health insurance companies, with or without patient participation in the cost of health care, since the services are not covered and the majority of the sample perceives the costs as high. Public intervention through the collaboration of private physicians and public health facilities and/or the increase of assisted reproduction units in the region is also considered appropriate. In addition, bureaucratic procedures for treatment of citizens from countries outside the European Union must be simplified and auditors must be appointed to ensure that providers comply with international standards.

As for assisted reproduction units, the most important factor affecting demand is quality. The most basic tactic to assess whether a provider is suitable to provide services is certification and accreditation by international bodies.

Collaboration between physicians at the women's place of origin and physicians at the facilities where they receive care is also considered important to ensure continuity of care without complications. Given the desire of respondents for accommodation following medical care, it is also considered necessary to strengthen the collaboration of health care providers with tourism providers.

Finally, appropriate marketing measures are considered necessary, based on the fact that the majority of women were informed about

assisted reproduction services primarily by health professionals and from their usual environment. Promotional measures include highlighting the country's tourist assets, increased marketing via the Internet, seminars and conferences, magazines on international flights, and other appropriate avenues. Finally, the creation of more Greek intermediary organizations, but operating internationally.

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