

Challenges affecting couples resorting to Assisted Reproductive Treatment (ART) in Romania

Abstract

Objective: The aim of this paper is to illustrate the main points of interest regarding the way treatment of infertility impacts the life of couples who struggle with this condition in Romania. The unique aspects and specific challenges regarding social, financial and psychological implications that affect Romanian couples who access specialized treatment for infertility will be thoroughly discussed.

Methods: This study is a descriptive cross-sectional research. The sample population included patients who attended specialized infertility treatment (Assisted Reproductive Techniques - ART) in Fertility Clinics from Romania. The study was conducted between 2017 and 2019 and data was gathered through two infertility questionnaires.

Results: The questionnaire for women was filled in by 829 female participants who struggled with infertility and resorted to ART and the questionnaire for men was completed by 227 male participants, as partners of the women, some of them as well with fertility issues. We analysed the results regarding all aspects surrounding infertility and ART, such as: psychological implications, impact of stress, access to specialized treatment, costs for treatment.

Conclusion: The results showed that couples who struggle with infertility have to deal with high costs for specialized infertility treatments, in addition to stress related to treatment, creating a combination which negatively impacts their future chances of getting a pregnancy.

Keywords: assisted reproductive treatment (ART), female infertility, male infertility

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Introduction

One in six couples worldwide and approximately 25 million citizens in The European Union are confronted with infertility.¹ The World Health Organization (WHO) recognizes that both women and men suffer considerable psychological stress when faced with reproductive health issues, including low self-esteem, isolation, anxiety and depression.^{2,3} Moreover, the psychological impact of infertility has been shown to be similar to other chronic conditions such as hypertension, heart failure or even cancer.⁴

Besides the aforementioned negative consequences, infertility could be a source of social pressure with significant impact on social status.^{5,6} Existing research has suggested that infertility affects women more profoundly than men, sometimes turning them into victims of domestic violence, economic deprivations and social isolation.⁷

General knowledge regarding the subject and governmental outreach for couples in need is still suboptimal all across EU. Some countries (i.e. Romania) even lack specific regulations and fertility policies.⁸ By contrast, patients and some medical professional associations are trying to raise awareness concerning this issue.⁹

In Europe, those seeking treatment are more likely to have higher educational degrees and an above average socio-economic status.⁹ Couples usually decide to become parents later in life, even in countries such as Sweden where infertility treatment is covered by the government.¹⁰

Assisted Reproductive Techniques (ART) has led to a radical change in the way both doctors and patients perceive infertility.

Consequently, access to specialized infertility treatment is subject to a lot of debate, as it differs vastly across countries.^{6,12}

A disorganized lifestyle (including smoking and alcohol consumption), social stress and a BMI outside the normal range, all have the potential to significantly reduce ART success rates, but the most important factor remains the woman's age.^{13,14}

Women with infertility largely consider that stress played an important role in their inability to conceive.¹⁵ Furthermore, patients undergoing ART are very concerned that stress may reduce their likelihood of becoming pregnant.^{16,17}

While evidence from physiological studies and clinical research suggests different pathways through which stress and depression may affect female fertility, the results of epidemiological studies on fertility that have this primary outcome are few.¹⁸ This has led to non-specific conclusions in identifying the effect of depression on infertility.⁴

A number of studies have been published that have indicated higher levels of stress and higher prevalence of depression and anxiety among infertile women receiving fertility treatment compared to the general population.¹⁹ Moreover, the prevalence of these symptoms increases in patients who have had repeated IVF cycles after failed attempts.^{20,21}

However, it is important to recognize that at least half the time infertility within a couple is caused by male problems.²² The psychological aspects of male fertility are under-studied and underestimated, as reviewed by Hall et al.²³

The aim of this paper is to illustrate the main points of interest regarding the way infertility impacts the life of women who struggle with this condition. We will discuss specific aspects regarding social, financial and psychological implications of Romanian couples with infertility that access specialized treatment.

Methods

This study was a descriptive cross-sectional research conducted between 2017 and 2019. The sample population included couples who resorted to assisted reproductive treatment in Fertility Clinics from 5 important medical centres in Romania: Bucharest, Timișoara, Iași, Cluj, Sibiu. Subjects were invited by their physicians to complete two questionnaires (one for each partner) elaborated by the researchers. The questionnaires were also made available online for ease of use and to assure filling completeness and submission. Informed consent for data processing was given by the participants who were assured about the privacy of research and their right to remain anonymous.

This study was conducted after obtaining ethical approval from the Local Ethics Committee of Scientific Research from “Pius Brînzeu” Emergency County Hospital Timisoara, Romania.

The specific questionnaire designed for women was organized in 8 sections and contained 65 questions. The first section represented the patients' consent for completing the questionnaire, the second section dealt with demographic characteristics and sections 3-7 referred to obstetrical and gynaecological conditions related to infertility. The last section dealt with socio-economic and psychological aspects surrounding infertility that have an important impact on the quality of life of women who struggle with this disease.

Regarding the questions designed for social and financial aspects, they referred to issues such as: current annual household income, level of education or money invested by couples in ART. Psychological involvement and correlation of stress disorder and depression with success of ART were also assessed. Other important variables that were studied were: number of doctors consulted regarding this issue, partner's emotional support, amount of time couples tried to conceive naturally, as well as pregnancy results and percentage of pregnancies obtained by ART.

The questionnaire designed for men contained 30 questions, such as medical conditions related to infertility, sexuality aspects, but also psychological involvement.

Statistical analysis

The collected data was analysed by SPSS software for Windows, performing Chi² Test, Kruskal-Wallis Test, Mann-Whitney U test, and Spearman correlation, P significance <0.005.

Results

Aspects regarding female infertility

A number of 829 women who struggled to obtain a pregnancy and resorted to ART completed the questionnaire designed for women. Additionally, 227 men filled in the questionnaire designed for men as partners of women involved in the study. The mean age of women was 32, the youngest being 24years old and the oldest 44years old. Regarding their marital status: 86.6% were married and 13.4% were in a relationship. Concerning their employment status our study showed that 84.3% of women were employed, 6.5% were self-employed and 8.7% unemployed. (Table 1).

Table 1 Evaluated variables in women resorting to Assisted Reproductive Treatment (ART) in Romania

Variables	Values	N (%)	
Demographic characteristics			
Age	<35years	496 (65.3%)	
	≥35years	264 (34.7%)	
Marital status	Married	718 (87.6%)	
	In a relationship	102 (12.4%)	
Employment status	Employed	699 (84.7%)	
	Self-employed	54 (6.5%)	
	Unemployed	72 (8.7%)	
BMI	Underweight	35 (4.3%)	
	Normal	482 (59.2%)	
	Overweight	200 (24.5%)	
History	Obese	97 (11.9%)	
	Smoking	Yes	313 (38.1%)
		No	509 (61.9%)
Attempt for natural conception	<5years	280 (38.6%)	
	5-10years	350 (48.2%)	
	>10years	96 (13.2%)	
	Spontaneously	88 (10.6%)	
Pregnancy conditions	After ovarian stimulation	27 (3.2%)	
	After IUI/FIV/GIFT	246 (29.6%)	
	No pregnancy	468 (56.5%)	
Pregnancy obtained by ART	IUI	54 (22%)	
	FIV	138 (56.1%)	
	GIFT	8 (3.3%)	

Results showed a normal BMI in 59.2% of cases, while 24.5% of women were overweight, 11.9% were obese and just 4.3% underweight. Concerning lifestyle choices, 38.1% had a history of smoking (Table 1).

Regarding the period of time the women attempted for natural conception a percentage of 38.6 % tried less than 5years in order to obtain a spontaneous pregnancy, while 48.2% had a 5 to 10 years period and the rest of 13.2% experienced a longer period of more than 10years.

In what the pregnancy results are concerned, 56.5% of women did not obtain a pregnancy, and for those who obtained, only 10.6% obtained a spontaneous pregnancy, 3.2% obtained a pregnancy after ovarian stimulation and a significant percentage of 29.6% after IUI/FIV/GIFT. Regarding success of assisted reproductive techniques in the group of women who obtained a pregnancy through ART, 56.1% of women obtained a pregnancy after IVF, 22% of them after IUI and only 3.3% after GIFT (Table 1).

Impact of stress

We subdivided the women who were exposed to stress in 2 categories: those without significant stress (those who experience stress rarely or never - first category) and those who confront with

stress (very often and quite often - second category). The duration of conception (in years) until the respondents obtain a pregnancy is significantly increased for those who are more often exposed to stress (Mann-Whitney Test, $p=0.021$) (Table 2).

Table 2 Correlation between period of time the women tried to conceive and exposure to stress. The total number of respondents was lower at this particular question

Stress exposure	N	Mean (years)	Std. deviation	Std. error mean	Mean rank
No	307	7.87	5.948	0.339	350.30
Yes	420	8.83	5.942	0.290	594.01

Thus, prolonged exposure to stress can be considered a significant risk factor for prolongation of infertility status (OR=0.12), with 95% Confidence Interval for OR (1.29; 3.47).

In addition, we evaluated the correlation between level of stress and educational degree, by stratifying the results in a higher education

group (women who graduated from University, or women with a Master of PhD) and lower education group (women who do not have a higher education degree). The results show that the percentage of women who are exposed to stress is significantly increased in the lower education group (test χ^2 , $p=0.011$) (Table 3).

Table 3 Correlation between stress and level of studies

Higher education	Stress		Total
	No	Yes	
No (Primary/Gymnasium/Professional school/High school)	61 34.5%	116 65.5%	177 100.0%
Yes (University/Master/PhD)	292 45.1%	355 54.9%	647 100.0%

As well, we analysed two groups of women: those who could not achieve a pregnancy and those who eventually obtained a pregnancy. The results showed that stress level is significantly higher in the case

of women who did not achieve a pregnancy, as seen in the Table 4 (Mann-Whitney Test, $p=0.046$).

Table 4 Correlation between stress and pregnancy achievement

Stress levels based on achieving conception			
Has conception been achieved?	N	Mean rank (stress level)	Sum of ranks
No	648	434.92	68717.00
Yes	158	395.84	256504.00
Total	806		

Regarding the importance of partner's support in dealing with infertility aspects, the results show that patients with greater support

from the partner are significantly less stressed (Mann-Whitney Test, $p < 0.001$) (Table 5).

Table 5 Effect of partners support in handling stress associated with infertility

Stress levels based on support given by spouse			
Has the spouse given any support?	N	Mean rank (partners support)	Sum of ranks
No	352	442.97	155924.50
Yes	469	387.01	181506.50
Total	821		

Aspects regarding male infertility

The proportion of subjects with erectile dysfunction is significantly increased in those with a feeling of discouragement towards infertility (χ^2 test, $df=1$, $p=0.047$) (Table 6).

However, the feeling of discouragement represents an insignificant risk factor for the occurrence of erectile problems (OR=2,399 with the 95% confidence interval for OR of (0.945; 6.09)) (Table 6).

Table 6 Correlation between male infertility discouragement status and erectile dysfunction

Feeling regarding infertility	Erectile dysfunction			Total
	N/A	Yes	No	
N/A	1 20%	0 0%	4 80%	5
Discouraged	3 2.9%	17 16.5%	83 80.6%	103
Optimistic	3 3.3%	7 7.6%	82 89.1%	92

The proportion of subjects with abnormal spermogram results is significantly increased among those who present a feeling of discouragement towards infertility (Chi² test, df=1, p=0.011) (Figure 1).

Moreover, the feeling of discouragement represents a significant risk factor for the incidence of abnormal results of the spermogram (OR=2,131 with the interval of 95% confidence for the OR of (1.184; 3.836)).

The proportion of subjects with erectile dysfunction is significantly increased in those with a disordered lifestyle (Chi² test, df=1, p=0.018) (Figure 2).

In addition, disordered lifestyle is a significant risk factor for erectile dysfunction (OR=3,067 with 95% confidence interval for OR of (1.284; 7.327)).

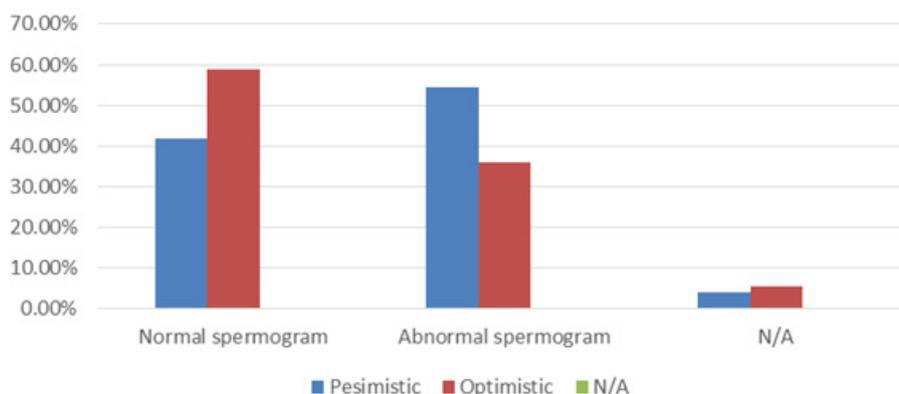


Figure 1 Effect of the feeling of discouragement on spermogram results.

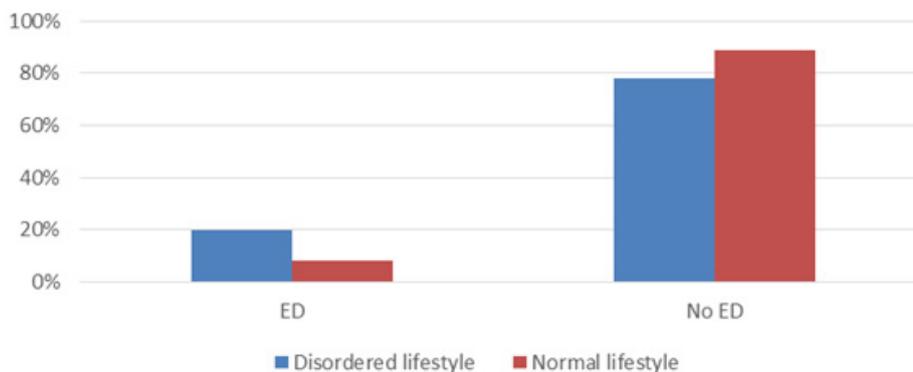


Figure 2 Erectile dysfunction (ED) variation with the disordered lifestyle.

Financial aspects and access to assisted reproductive techniques

As our study has shown, an important percentage of patients (29.7%) paid for the treatment more than 4500Euros; 27.9% paid between 1000-2500Euros, 27,4% had costs for the infertility

treatment of less than 1000Euros, and the rest of 12,5 % of patients paid between 2500-4500 (Table 7).

Unfortunately, only 16,4 % of all patients had their procedures covered partially by the Health Insurance Programme and just 0,6 % had the total cost of treatment covered by Health Insurance Programme (Table 8) (Table 9).

Table 7 Cost of assisted reproductive techniques treatment for infertile couples

n (%)	Cost of treatment				Total
	Under €1000	€1000-2500	€2500-4500	Over €4500	
Cost of treatment	227 (28.1%)	231 (28.6%)	104 (12.9%)	246 (30.4%)	808 (100%)

Table 8 The average income per month of the couples who resorted to ART

n (%)	Income				Total
	Under €1000	€1000-1200	€1200-1500	Over €1500	
Average income per month	156 (19%)	293 (35.7%)	190 (23.1%)	181 (22.1%)	820 (100%)

Table 9 Financial coverage by the state for assisted reproductive techniques treatment

Financial coverage by the state	Absolute/relative frequency	% Valid
N/A	15 (1.8%)	1.8
None	673 (81.2%)	81.2
Partial	136 (16.4%)	16.4
Integral	5 (0.6%)	0.6
Total	829	100.0

The association between the average monthly income per family and the financial coverage by the state is significant (Chi² test, $p=0.041$). The proportion of patients with an average monthly income of more than 1200 Euros and having treatment expenses partly covered by the state is significantly higher than the proportion of patients with an income below 1200 Euros and having these expenses covered ($p=0.048$) (Table 10).

The association between the monthly average income per family and the value of the investments in treatments is significant (Chi² test, $p<0.001$). The proportion of patients with an average monthly income of more than 1200Euros and having expenditures of less than 1000Euros is significantly lower than the proportion of patients with an income below 1200 Euros ($p<0.001$) (Table 11).

Table 10 Correlation between income and financial coverage by the state for ART treatment

Income	Financial coverage by the state			
	No	Partially	Totally	Total
Under €1200	294 79.2%	73 19.7%	2 0.5%	371
Over €1200	373 83.1%	63 14.0%	3 0.7%	449
p	0.205ns	0.037s	0.903ns	-

Table 11 Correlation between income and costs for infertility treatment

Income	Cost of infertility treatment (€)				Total
	Under €1000	€1000- €2500	€2500- €4000	Over €4000	
Over €1200	78 21.0%	115 31.0%	41 11.1%	135 36.4%	371 100.0%
Under €1200	148 33.0%	115 25.6%	63 14.0%	109 24.3%	449 100.0%
p	<0.001s	0.102ns	0.256ns	<0.001s	-

An increase in family income does not improve the chance of achieving a pregnancy, as observed in Table 12. This shows that underlying factors, such as gynaecologic conditions or male infertility

causes are more likely to influence the pregnancy outcome, in comparison to this particular financial aspect.

Table 12 Correlation between the possibility to achieve a pregnancy and family income

	Family income				Total
	Under €1000	€1000- €1200	€1200- €1500	Over €1500	
No pregnancy	54 (19.1%)	95 (33.7%)	77 (27.3%)	54 (19.1%)	282 (100.0%)
Achieved pregnancy	102 (18.9%)	195 (36.0%)	111 (20.5%)	127 (23.5%)	541 (100.0%)

The association between coping with stress and expenses is significant (Chi² test, $p=0.018$). The proportion of those who invested below 1000 Euros is significantly higher for people with less stress (those who invested less than 1000 are less stressed); the proportion of

those who invested between 1000 and 2500 is significantly higher for those with higher levels of stress (those who invested between 1000-2500 are more stressed) (Table 12) (Table 13).

Table 13 Correlation between stress and costs for treatment

Stress	Cost of infertility treatment (€)				Total
	Under €1000	€1000- €2500	€2500- €4000	Over €4000	
No	113 (32.0%)	84 (23.8%)	52 (14.7%)	98 (27.8%)	353
Yes	114 (24.2%)	147 (31.2%)	52 (11.0%)	146 (31.0%)	471
p	0.016 s	0.024 s	0.139 ns	0.358 ns	-

Discussions

Regarding their educational level, almost 80% of women involved in the study have graduated University or have a Master/PhD degree, meaning that the level of education is very important and may have some impact in the way women face infertility problems. Higher education level was associated with a decrease in population-based studies. A few aspects must be emphasized: firstly, the importance of education in understanding the negative effects of a risky sexual behaviour or the negative effects of an unbalanced lifestyle on fertility.²⁴ Secondly, delaying the time of motherhood, as higher educational goals may be compromised by the fact that both parenting and studying are time-consuming.²⁵ Moreover, financial impact of infertility treatments that can further jeopardize the chances to continue education.²⁶ Interestingly enough, studies conducted in Scotland found no relation between higher education and infertility,²⁷ like in our study. These different results are due to significant geographical variations of socio-economical inequalities that are associated with infertility and access to assisted reproductive techniques. Our results show that the percentage of women who are exposed to stress are significantly increased for those without a higher education degree (test Chi², $p=0,011$). This means that women with higher education are more informed concerning infertility and the possibility to obtain a pregnancy using assisted reproductive techniques, so they don't not face stress at the same level with women who do not have graduated from University.

In an article by Li et. al based on the psychological aspects of infertility, two samples of 100 infertile and 100 fertile couples were used with the main measure being the quality of life impact. After the analysis of the findings, the infertile group had a poor quality of life irrespectively of their marital adjustments.²⁸

One of the most controversial areas in the field of reproductive medicine is the potential impact of psychological factors on pregnancy rates. Some studies have shown that the more distressed the women are prior to and during infertility treatment, the lower become the pregnancy rates.^{29,30} On the opposite, there are studies that do not find any correlation between that emotional distress caused by fertility problems and the future chance of becoming pregnant.³¹ In our study, we noticed that women who did not get a pregnancy are more stressed, as well as those who are not supported by their husbands in this process. Discouragement regarding the chance of pregnancy positively correlates with stress and depression. The association between coping with stress and expenses for obtaining a pregnancy is significant. As well, regarding the amount invested, we noticed that women who invested less than 1000 Euros are less stressed than those who invested between 1000 and 2500 Euros. Investing more money

in this process means higher expectations that have to be fulfilled, so women will get even more stressed as they invest more money. A significant percentage of couples, 29,7% paid for the treatment more than 4500 Euros, which represents a big amount of money for Romania, where the average take-home salary in 2020 is around 3,000 RON per month (625Euros).³² Couples have to sustain great financial efforts in order to get access to specialized fertility treatment.

In addition, the fact that the majority of couples have to support the costs for the treatment is another reason for stress. Our study revealed that only 0.6% had total costs covered by Health Insurance Programme, and only 16.4% of all patients had the procedures and treatment covered partially by the Health Insurance Programme. When people invest their own financials in order to obtain a pregnancy the expectations become higher, and every failure is associated with the possibility to invest even more money, without any guarantees for obtaining a pregnancy. This phenomena creates a vicious cycle, especially for those who are more susceptible for mental disorders and the lack of money associated with disappointment, frustration, stress will negatively impact their quality of life and their future chances for obtaining a pregnancy.

In Romania, education regarding prevention or causes of infertility is almost inexistent. Most couples usually have no idea that postponing pregnancy will have a negative impact on future conception. Lack of information, lack of screening for gynaecological disorders, high costs for specialized infertility treatments in addition to psychological implications, all lead to a high incidence of infertility cases, with low access to specialized care. It is recommended that infertility education services should be implemented in the health and clinic facilities. As well, infertility prevention should be included in other programs such as those regarding prevention of Sexually Transmitted Infections. Lastly, access to reproductive organ imaging should be enhanced for early detection of the various causes of infertility in women.³³⁻³⁵

The birth rate in Romania is one of the lowest among EU Member States, with 8.8 births per thousand inhabitants, compared to an EU average of around 10 (36). At the same time, the fertility rate in Romania registered a decrease: from 2.2 births/woman in 1989 to 1.2 in 2015, that in the context of an EU average of 1.6.³⁷

The decrease of the birth rate is based on the changes in lifestyle, young people prioritizing career consolidation or the purchase of a house.^{38,39} Declining births adds to the problems of mass emigration and a high overall mortality rate that also affect Romanian population.

Infertility is under-treated and under-diagnosed in Romania. There is no major interest to support rapid diagnosis and rapid resolution. There is no legislative regulation regarding the treatment of infertility

despite numerous attempts at national level. In 2009, a written request to the European Commission raised the question of the need for a national legislative framework, but a legislative project on infertility is still under debate.^{40,41}

In the last decades, there has been a significant decline of male fertility, particularly caused by advanced age, different environmental factors, and disorganized lifestyle.^{42–44} There is a lot of debate regarding male infertility and the role of lifestyle factors in the development of infertility. As well, there have been a lot of correlations between psychological involvement and infertility, but at present it is hard to establish a direct cause-effect relationship. While stress is associated with a decrease of the potential male fertility, there is no general consensus on how to measure it objectively.⁴⁵ Thus, a lot of emphasis is put on the benefits regarding lifestyle improvements, such as a well-structured program of physical exercise, educational, nutritional or even psychological support. All these will positively impact the quality of life of males that face infertility, with improved chances to conceive spontaneously or optimize the chances of conception.

Despite all the financial, legislative and psychological issues, there has been made a lot of effort either by the Romanian Society for Reproductive Medicine and Romanian Embryologists Association or by others Patient's associations and the results can be seen in the total number of pregnancies obtained, which is similar to worldwide statistics. The quality of ART cannot be disputed and the number of private clinics in Romania has considerably increased.

Conclusion

Infertility in Romania still remains a severe problem, in spite of all measures taken to support infertile couples. There are a lot of discussions and concerns that surround infertility and most of all, the possibility to benefit from specialized care. There are enormous differences between couples who access assisted reproductive techniques, especially concerning financial coverage by the government. In Romania, support for infertile couples is limited to a certain number of couples that meet all required criteria. Moreover, there are no specialized programs in order to offer psychological support to couples, and a significant part of them have to deal with symptoms of anxiety, depression, stress. All these negatively impact the future possibility to obtain a pregnancy and couples have to make big efforts to overcome all barriers involved.

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Conflicts of interest

The authors declare that they have no competing interest.

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