Emotional disorders, marital adaptation and the moderating role of social support for couples under treatment for infertility

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ABSTRACT

Objectives: Over the last few years, the impact of infertility on the psychological well-being of couples has been well recognised. Men and women with infertility experience stress, anxiety and depression and their relationship might be under pressure.

Material and methods: We conducted a non-experimental correlational descriptive study where transversal analysis using questionnaires and quantitative data was performed for 76 couples with diagnosed infertility under the care of various reproductive medicine clinics in Romania between 2018 to 2019. Participants were asked to fill, via internet or in person, a set of tests including data on socio-demographic and infertility characteristics along with five psychological tests: The Fertility Problem Inventory (FPI), State-Trait Anxiety Inventory, Beck's Depression Inventory (BDI), Dyadic Adjustment Scale and Interpersonal Support Evaluation List-12. The aim of the study was to explore how couples with infertility respond and adapt to this diagnosis and to assess the relationship between emotional disorders, marital adjustment and social support.

Results: Mean age of females was 34.2 and of males 36.7 and 38.2% of the couples were experiencing infertility for > 6 years. Women had worse scores on infertility-related distress (FPI) (t = −4.35, p = 0.01), on the BDI depression scale (t = −5.43, p = 0.01) and on anxiety scales (t = −5.48, p = 0.01). Participants with a longer duration of infertility scored significantly higher on infertility-related distress than those with more recent difficulties. Marital adjustment scores correlated negatively with emotional disorders. Both appraisal social support and belonging support moderated the relationship between state-anxiety and marital adjustment.

Conclusions: Infertility carries a significant psychological burden for the couple and the longer its duration, the higher the distress level. Women seem to be more vulnerable to its psychological consequences. Marital adjustment correlates negatively with the degree of emotional disorders. In couples with high levels of social support, the relationship between state-anxiety and marital adjustment was negatively correlated.

Key words: infertility; emotional disorder; marital adaptation; social support

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INTRODUCTION

Over the past few years, the impact of infertility on the psychological well-being of couples has been recognized and documented by researchers. There is no doubt that infertility is a complex and difficult experience for many couples. Data shows that there is a significant association between infertility and loss of self-esteem, guilt, frustration, anxiety, depression, and marital problems (particularly sexual problems) [1]. Among the emotional disorders of infertile couples, stress, depression and anxiety are predominant aspects. Infertile women are more likely to experience negative emotions rather than their male partners [2]. Infertility in women may be associated with diagnoses as endometriosis or ovarian tumors that carry their own burden on the patients' anxiety levels, and this affects the quality of life [3, 4]. To make things even more complicated, there is evidence that anxiety and depression further reduce the couple's ability to conceive a child [5]. Zhou et al. showed that for couples undergoing in vitro fertilization (IVF) treatment that experience higher level of stress, documented

by increased levels of salivary alpha-amylase, women have a higher risk of pregnancy failure and men have lower sperm density, motility and viability [5, 6].

Depression is a common condition associated with infertility. Advanced maternal age, over 30 years, time of infertility, low education level and low social support represent the main risk factors for depression [7]. Thus, depression affects 34–54% of women and 23–32% of their male partners diagnosed with infertility [8]. Taking into consideration that, despite the good prognosis and the availability of treatment options for depression, it's been observed that the more likely is she to give up after a single treatment procedure, due to emotional imbalances [9].

Infertility can have major effects on a couple's life, including marital satisfaction, as well as having a remarkable role in family life and well-being [10]. A satisfying marital relationship is a significant predictor of general happiness and well-being, while poor quality of marital relationships is associated with many family and community problems [11, 12]. Taking these into account, infertility may be a turning point in a couple's life, leading to potential conflicts [13], and in some cases, even divorce [14, 15].

While most psychosocial studies have focused on investigating risk factors in infertile couples [16], there have been several studies that looked into the protective factors, such as the positive impact of social support and social interactions in men and women who face infertility [17]. Social support plays a key role in how an individual adapts when it comes to a present difficulty. It is generally perceived as an act of availability, which requires confidentiality and care [18]. Despite the stressful experience, those with significant social support will suffer less from the potentially harmful effects of that stressful event, thus facilitating adaptation [17].

There is a significant negative relationship between social support and stress associated with infertility [8]. Social support is one of the mechanisms of resilience against the challenges of infertility. This condition has an important role in reducing the negative effects of this medical problem and in improving self-control, increasing self-confidence and quality of life [19].

The aim of this study was to investigate how Romanian couples respond and adapt to infertility. We also assessed the associations between emotional disorders, marital adjustment and social support.

MATERIALS AND METHODS
Design

The current study was a non-experimental, quantitative with transversal analysis and data obtained with the use of questionnaires. It was designed as a descriptive, correlational study in which various hypothesis were tested.

Procedures and participants

The study was conducted between August 2018 and November 2019 and was approved by the Research Ethics Committee of the University of Bucharest. Couples under infertility treatment in various Romanian clinics were approached and asked for voluntary participation. Before completing the questionnaires, couples received information leaflets regarding the purpose of the study, data collection and storage methods. Couples signed an informed consent form. The research ethics principles were respected: the confidentiality of data and anonymity of the participants. The instruments used and work procedures were noninvasive and did not put the couples in any stressful or frustrating situations. Questionnaires were individually filled out, given directly or via the internet.

Instruments

Couples were asked to complete a general form including data on socio-demographic characteristics (age, marital status, level of education) and infertility related information (duration, infertility type, treatment, number of fertilizations, previous pregnancies, biological or adopted children). Furthermore, they completed the following scales:

a) The Fertility Problem Inventory (FPI) [20]. This is a widely used instrument to measure infertility-related stress and infertility-related beliefs; it includes 46 items and its score ranges from 46 to 276. The scale assesses five dimensions: social concern, sexual concern, relationship concern, rejection of childfree lifestyle and need of parenthood. The higher the score, the higher the infertility stress. For this study, Cronbach's alpha coefficients range from 0.70 to 0.84.

b) State-Trait Anxiety Inventory Form Y (STAI-Form Y) [21]. The STAI is a 40-item scale that uses a four-point Likert scale ranging from almost never to almost always. The STAI-S assesses the intensity of the current anxious feeling at that moment and the STAI-T indicates how the couples generally feel. The STAI has been adapted to Romania and has been found to have satisfactory psychometric properties. For this study, the Cronbach's alpha coefficient were 0.95-for STAI-S and, 0.89 for STAI-T.

c) Beck's Depression Inventory II (BDI-II) [22]. The BDI is a self-report rating inventory that consists of 21 items and measures different areas of depression symptomatology during the past few weeks. Each question consists of four possible responses ranging in intensity. BDI scoring ranges from 0 to 63 with a higher total score indicating more severe depressive symptoms. For this study, the Cronbach's alpha coefficient was 0.91.

d) Dyadic Adjustment Scale (DAS) [23]. DAS is used for evaluating marital satisfaction. DAS is a 32 items self-report

evaluation instrument that can be completed by one or both partners, and has four subscales: Dyadic consensus (13 items), Affective expression (5 items), Dyadic cohesion (4 items) and Dyadic satisfaction (10 items). This instrument has been validated and standardized in Romania. The Cronbach's alpha reliability analysis was applied to measure internal consistency: for this study it was α = 0.93. Also, Cronbach's alpha was applied for every subscale, ranging from α = 0.67 to α = 0.91.

e) Interpersonal Support Evaluation List-12 (ISEL-12) measures perceived social support [24]. The ISEL-12 can be scored by summing the items to create an overall social support score; three subscale scores representing appraisal, belonging, and tangible social support have also been proposed. For present study, Cronbach's alpha ranges from 0.63 to 0.77. IBM SPSS Statistics for Windows, version 25 was used as the data processing and analysis program [25]. All statistical tests with a p value < 0.05 were considered statistically significant.

RESULTS

Sample characteristics

The research sample consisted of 76 couples (n = 152 participants) with fertility problems. Table 1 describes the demographic and fertility characteristics of the infertile couples. Six participants (3.9%) consider that they have an excellent state of health, 47 participants (30.9%) very good, 88 participants (57.9%) considered that they have a good state of health, and 11 participants (7.2%) state that their state of health is reasonable.

Regarding the type of infertility, in 43 couples (56.5%) the infertility was classified as primary, and in 33 couples (43.5%) as secondary. Out of the couples with secondary infertility, 14 have one child, 6 have two children, and one couple had three children.

Some of the couples underwent certain medical or surgical interventions aiming to get pregnant. Seventeen patients (11.2%) had a surgical intervention for obstructed fallopian tubes, 22 patients (14.5%) required other medical intervention.

The Fertility Problem Inventory (FPI), State-Trait Anxiety Inventory (STAI) and Beck's Depression Inventory (BDI).

With the use of the T test for independent samples, there were statistically significant differences between women and men in the overall scores of FPI (t = −4.35, p = 0.01, the overall BDI depression scale (t = −5.43, p = 0.01) and on anxiety scale (t = −5.48, p = 0.01). Also, there were significant differences between the women and men, in terms of the subscales of the FPI test: "Social concern" (t = −4.74, p = 0.01), "Sexual concern" (t = −3.20, p = 0.02), "Relationship concern" (t = −2.49, p = 0.01), and "Need of parenthood" (t = −2.89, p = 0.01).

The size of the d-Cohen effect was calculated and showed the magnitude of the difference between the two groups. Thus, for both the distress scale and the depression and anxiety scales, the effect size parameters indicated medium and high effects (ranging from 0.40 to 0.89). Following the results, it can be stated that the differences are statistically and practically significant, so that women have higher scores on the scales of distress, anxiety and depression compared to men.

The results of the unifactorial variance analysis with ANOVA for FPI indicated that there were significant differences in infertility-related stress between couples experiencing different infertility time intervals [F (2,149) = 4.36, p = 0.014] (Tab. 2).

Bonferroni-type post-hoc analysis to reduce the risk of detecting false-positive results due to multiple analysis identified significant differences in the infertility distress score between couples experiencing a relatively short duration of infertility (1–2 years) and those who faced a relatively long duration of 3–5 years (difference between averages 0.05, p = 0.014, confidence interval of differences between

Table 1. Demographic and fertility characteristics of the infertile couples (n = 152)

Age, years [mean]	76 couples n = 152	
	Female: m = 34.25 (SD = 0.489)	Male: m = 36.76 (SD = 0.511)
Education Elementary school High school Post-secondary school Without bachelor's degree Bachelor's degree Postgraduate degree	2% 9.2% 5.3% 5.9% 35.5% 42.1%	
Marital status Married Live with a partner	86.8% 13.2%	
Duration of infertility 1–2 years 2–5 years More than 6 years	27% 34.9% 38.2%	
FIV treatment Not yet One treatment Multiple treatment	31.6% 27.6% 40.8%	

Table 2. Variance analysis between independent variable (duration of infertility) and psychopathology scales (n = 152)

Overall score of infertility-related distress (FPI)					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	0.074	2	0.037	4.358	.014
Within Groups	1.259	149	0.008		
Total	1.332	151			

Df — degree of freedom; F — Anova test; Sig — statistical significance

Table 3. Differences in the score on marital adjustment between couples depending on the cause of infertility

ANOVA

		Sum of Squares	Df	Mean Square	F	Sig.
DAS-Affective expression	Between Groups	0.128	3	0.043	3.452	0.018
	Within Groups	1.825	148	0.012		
	Total	1.952	151			
	Within Groups	0.619	148	0.004		
	Total	0.631	151			

Df — degree of freedom; F — Anova test; Sig — statistical significance

Table 4. Post-hoc analysis regarding the differences between couples in cases of female infertility when compared to couples with male infertility

Bonferroni

Dependent Variable	(I) Cause	(J) Cause	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
DAS-Affective expression	Female	Male	0.06827*	0.02448	0.036	0.0028	0.1337
		Both	0.05543	0.02266	0.094	−0.0052	0.1160
		Unexplained	0.01377	0.02955	1.000	−0.0653	0.0928

Sig — statistical significance

averages of level 95% −0.101− −0.008). Therefore, couples experiencing a longer duration of infertility scored significantly higher on infertility-related distress than those with more recent difficulties.

Regarding the scores on the stress, depression and anxiety tests, statistical analysis revealed that there were no differences in the cause of infertility between the women and men participating in the study.

Dyadic Adjustment Scale (DAS)

We used the Pearson Correlation standard test for testing the correlation between marital adjustment and emotional disorders.

We found that the first subscale of DAS, "Couple consensus" correlated negatively with the overall score of infertility-related distress (r = 0.310, p < 0.01), with depression (r = 0.228, p < 0.01), with state-anxiety (r = 0.378, p < 0.01) and with trait-anxiety (r = 0.287, p < 0.01). The second subscale, "Couple satisfaction" correlated negatively with the overall score of infertility-related distress (r = 0.359, p < 0.01), with depression (r = 0.298, p < 0.01), with state-anxiety (r = 0.406, p < 0.01) and with trait-anxiety (r = 0.382, p < 0.01). The third subscale, "Affective expression" correlated negatively with the overall score of infertility-related distress (r = 0.267, p < 0.01), with depression (r = 0.301, p < 0.01), with state-anxiety (r = 0.417, p < 0.01) and with trait-anxiety (r = 0.341, p < 0.01). The finale subscale, "Couple cohesion" correlated negatively with depression (r = 0.235, p < 0.01), with state-anxiety (r = 0.181, p < 0.05) and with trait-anxiety (r = 0.195, p < 0.05). The overall scale of marital adjustment correlated negatively with the overall score of infertility-related distress (r = 0.330, p < 0.01), with depression (r = 0.307, p < 0.01), with state-anxiety (r = 0.411, p < 0.01) and with trait-anxiety (r = 0.357, p < 0.01).

As for the marital adaptation, there were differences between couples depending on the cause of infertility, but only regarding the subscale "Affective expression" (Tab. 3).

Post-hoc analysis demonstrated that there were significant differences between couples with female infertility when compared to couples with male infertility. Therefore, couples in which the woman faces infertility had a higher affective expression of marital adjustment compared to those in which the man was infertile (Tab. 4).

Interpersonal Support Evaluation List-12 (ISEL-12)

A series of models of moderation on the relationship between marital adjustment and emotional disorders by social support were tested. State-anxiety (independent variable) and social support (appraisal, belonging, and tangible-moderating variables) were standardized in z-scores, generating the interaction variable by multiplying them. Only two models were significant, namely moderators: appraisal social support and belonging support, in moderating the relationship between state-anxiety and marital adjustment.

For the first model, a hierarchical regression was performed compared to marital adjustment, with appraisal social support and state-anxiety in block 1, and the interaction variable in block 2. The R2 change value for the model with the interaction was 0.026, statistically significant [F (1,148) = 24.42; p = 0.018].
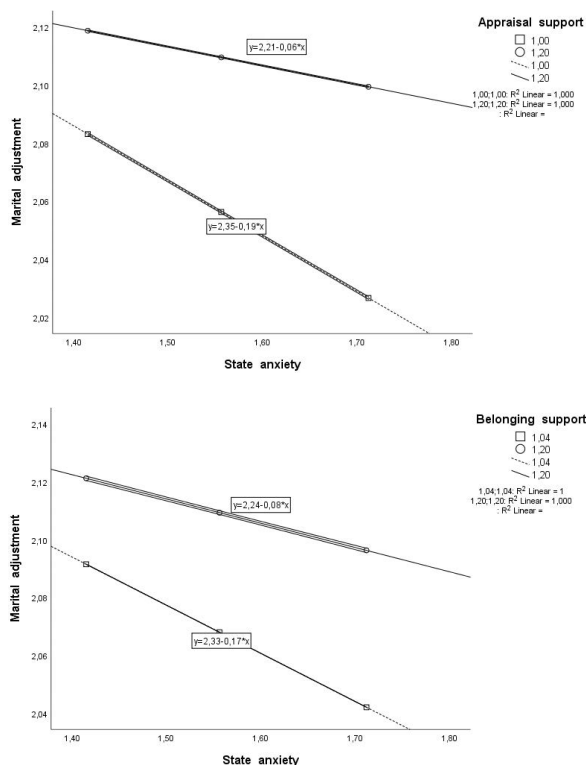
Figure 1. Appraisal (**A**) and Belonging (**B**) support attenuate the relationship between state-anxiety and marital adjustment

For the second model, the R2 change value for the inter-action between state-anxiety and belonging support was 0.020, statistically significant [F (1,148) = 26.06; p = 0.034]. These results indicate that both appraisal social support and belonging support moderated the relationship between state-anxiety and marital adjustment.

In order to find out the manifestation of the moderation effect, the level of anxiety was analyzed in relation with the upper and lower values of the social support, as well as the scatter-plot graphs (Fig. 1A and B). Thus, the moderation effect for both models tested was manifested by diminishing the relationship between state-anxiety and marital adjust-ment when social support had higher values.

DISCUSSION

The present study aimed to highlight how couples adapt to the diagnosis of infertility, exploring the relationship between emotional disorders, marital adjustment and social support. Infertility is a predominant problem in today's society, but especially among those who postpone conception for later age. In the present study, the mean age in women was 34.25 years while the mean maternal age in the Roma-nian general population in the same geographical area was found to be 28 years [26]. The scientific literature increas-ingly states that the less risky maternal age range in terms of obtaining a pregnancy is 20–30 years, but on the other hand, today's couples perceive the idea that they should postpone conception after 30 years old [27].

Our results show that, for infertile couples, stress, de-pression and anxiety are more common among women than men. This has also been reported in several previous studies [21, 28]. One of the characteristics of infertile cou-ples is that women are necessarily more deeply involved in treatment procedures and it is expected that they will be more affected by the process.

In general, women, when compared to men, reported higher levels of emotional difficulties during all stages of infertility [29]. The possible explanation for this could be the fact that women often feel guilty when a couple is infertile, and this can lead to social stigma. Therefore, women are more vulnerable than men to the negative psychological impact of infertility.

Infertility seems to have implications on the marital relationship as well. There are differences between partners regarding marital adjustment, consensus and satisfaction in the couple. In this study we hypothesised that marital adjustment is negatively correlated with emotional distress and when marital adjustment is high, emotional distress is low. One possible explanation is that the longer the time of infertility, the stronger the couple's relationship has the po-tential to become. Most respondents in this study stated that life without children brought them closer and strengthened their relationship. This has also been reported in the study of Schmidt et al. where the authors proposed that infertility may have certain marital benefits [30]. However, the same hypothesis may mean that emotional disorders increase when marital adjustment is low. Psychological pressure on men and women to have children can reduce intimacy and sexual satisfaction. Thus, infertility, through the impact on marital satisfaction or through the dysfunction of marital relations, can lead directly or indirectly to the failure of fertilization [31].

Infertility has also been associated with marital prob-lems, conflicts and has serious implications for the mental and social well-being of the involving parts. Infertile cou-ples have certain psychological disorders, including lack of marital satisfaction, lack of sexual satisfaction, loss of partner trust, decreased libido and dysphoric emotions [32, 33]. This can be problematic because the marital relationship is considered to be the most important source of support in the context of infertility treatment.

The results in our study show that social support is a significant factor in managing infertility and these re-sults are compatible witht those of previous studies [34]. We therefore proposed a theory whereby social support acts as a protective factor which moderates/attenuates the relationship between emotional disorders and marital ad-justment (Fig. 1). If a woman is unable to fulfil her role in
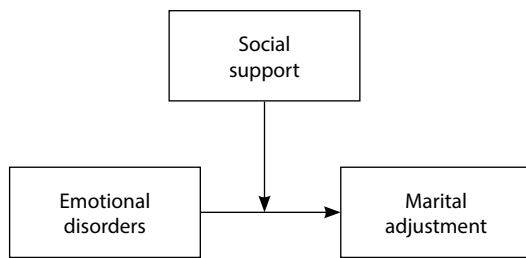
Figure 2. Moderation model — social support as moderator in the relationship between emotional disorders and marital adjustment

a traditional collective culture, in which maintaining marital status and giving birth to a child are landmarks of family life, she may suffer rejection, isolation and emotional abuse. On the contrary, if a woman is well supported by her family and especially her partner, then she is less succeptible to develop mental health issues or depression.

The present study contributes to the existing knowledge regarding emotional disorders and marital adaptation in infertile couples, having both theoretical and practical implications. It is well known that the experience of infertility affects the lives of both partners, and the failure of this common purpose in life affects the way they perceive themselves as a partners. Thus, the results of our study may support a clinician's decision to actively involve both partners in the diagnosis and treatment process, in accordance with the European Society of Human Reproduction and Embryology guidelines to meet the needs of both partners when the couple undergoes stressful treatment in medically assisted human reproduction technology [35].

The present study has several strengths that should be considered, including: (1) the concomitent evaluation of both symptoms of stress, with a specific instrument, and anxiety and depression; (2) assessment of marital relationship and social support; (3) the inclusion of both women and men facing fertility problems; (4) the examination of the aforementioned constructs according to certain demographic and clinical characteristics, such as the level of education, socio-economic status and type of infertility (primary or secondary); (5) the evaluation was carried out in several cities of Romania, which allowed the generalization of the results, unlike other studies that include participants from a single clinic.

The main limitation of this study is that because couples were volunteers and there were no available data for couples who refused to take part, we could not determine whether the analyzed sample may differ to some extent from the general infertile population. Another limitation is the cross-sectional design of the study. For this reason, no causal inferences can be made about the relationships between variables. In addition, the group of participants

was not tested longitudinally to possibly estimate changes in time. Future controlled or longitudinal studies will help clarify these relationships. The general aim should be the development of assessment tools specific to infertility issues, as this study and many other in the literature use mainly general tools [36].

Although the sample size is relatively small, the results allow formulation of solid conclusions and future directions. Appropriate intervention strategies to support couples facing infertility should be developed and implemented. In our study, all couples underwent medical treatment for their fertility problem, but only three couples in the entire sample received psychological counselling to manage the emotions associated with conception difficulties, although psychological interventions plays an important role in the treatment of infertility, relieving the emotional symptoms that are felt by couples [37].

Despite the above listed limitations, this paper contributes to the existing knowledge on emotional disorders, marital relationship and social support associated with infertility especially in Romanian couples. The results of the study are expected to contribute to the development of educational programs on the importance of married life and sexual health in the treatment of infertile couples, as well as appropriate methods of therapeutic intervention. Organizing support groups for infertile couples and developing psychotherapeutic/psychoeducational intervention programs that focus on developing strategies to deal with emotional disorders can have positive effects on their lives.

Further research for the factors associated with marital satisfaction in infertile couples could help find a way to help couples maintain their interest in treatments and increase their chances of success by planning effective interventions. Other psychological variables (for both partners), such as: quality of life related to the experience of infertility, attachment style, difficulties for infertile people, but also their relationship with health care providers in specialized fertility clinics should be looked into.

CONCLUSIONS

In conclusion, infertility carries a significant psychological burden for couples and the longer its duration, the higher the distress level. Women seem to be more vulnerable to the psychological consequences of infertility compared to men. In the couples undergoing infertility treatment, marital adjustment correlates negatively with the degree of emotional disorders. The better the marital adjustment, the lower the levels of stress, depression and anxiety. Social support is often a neglected component in managing infertility. In couples where social support had higher values, the relationship between state-anxiety and marital adjustment was negatively correlated.

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