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The effect of depressiveness and reframing on family life satisfaction in infertile and post-miscarriage couples: dyadic analyses

Efekt depresyjności i strategii przekształcenia znaczenia sytuacji na poziom zadowolenia z życia rodzinnego małżeństw bezpłodnych i po poronieniu: analizy diadyczne ¹

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Abstract: Couples struggling with infertility, as well as those after experiencing a miscarriage, deal with many types of stressors, in the face of which they react with anxiety, regret and depression, which negatively affects fertility and is associated with an increased risk of miscarriage. The use of different coping strategies seems to have different effects on the stress of infertility and miscarriage experiences. The aim of the study was to investigate the relationship between depression related to infertility and miscarriage and satisfaction with family life, as well as the role of reframing in predicting family life satisfaction in the group of depressive infertile and post-miscarriage couples. The study involved 90 couples: 50 couples after miscarriage and 40 couples diagnosed with infertility. The participants completed a questionnaire examining the level of depressiveness (Giessen Test), coping strategies in the family (F-copes) and the family assessment scale (Flexibility and Cohesion Evaluation Scales; SOR). The actor partner interdependence model was used for data analysis. The findings showed that the higher level of partner depressiveness in both infertile and post-miscarriage couples predicted lower family life satisfaction in women and men, while husband depressiveness was significant for women's family life satisfaction, but not the other way around. The reframing strategy used by partners in both studied groups significantly weakened the relationship between partners' depressiveness and the level of satisfaction with life. Stress is one of the most important risk factors influencing the results of infertility treatment and spontaneous miscarriage, therefore it is important to identify all factors related to depression symptoms and life satisfaction of infertile and post-miscarriage couples.

Keywords: depressiveness, family life satisfaction, infertility, miscarriage, reframing, stress

Abstrakt: Pary zmagające się z bezpłodnością, jak i te po doświadczeniu poronienia poddawane są działaniu wielu stresorów, w obliczu których reagują lękiem, żalem i depresją, co negatywnie wpływa na płodność i wiąże się ze zwiększonym ryzykiem poronienia. Stosowanie różnych strategii radzenia sobie wydaje się mieć różny wpływ na stres związany z niepłodnością i doświadczeniami poronienia.

¹ Polska wersja: <https://stowarzyszeniefidesetratio.pl/Presentations0/2021-3-Wend.pdf>

Celem pracy było zbadanie związków między depresyjnością związaną z niepłodnością i poronieniem a zadowoleniem z życia rodzinnego oraz roli stosowania strategii przekształcenia znaczenia sytuacji w przewidywaniu zadowolenia z życia rodzinnego w grupie depresyjnych par bezpłodnych oraz po doświadczeniu poronienia. W badaniu wzięło udział 90 małżeństw: 50 par z doświadczeniem poronienia oraz 40 par ze zdiagnozowaną niepłodnością. Uczestnicy wypełnili kwestionariusz badający poziom depresyjności (Test Giessen), strategii radzenia sobie z kryzysem w rodzinie (F-copes) oraz skalę oceny rodziny (Flexibility and Cohesion Evaluation Scales; SOR). Do analiz danych zastosowano actor partner interdependence model (APIM). Analizy wykazały, że wyższy poziom depresyjności partnerów zarówno z grupy małżeństw bezpłodnych jak i po poronieniu jest predyktorem niższego zadowolenia z życia rodzinnego u kobiet i mężczyzn, natomiast depresyjność męża ma istotne znaczenie dla zadowolenia z życia rodzinnego kobiet, ale nie odwrotnie. Strategia przekształcenia znaczenia sytuacji stosowana przez partnerów w obu badanych grupach w sposób istotny osłabia związek między ich depresyjnością a poziomem zadowolenia z życia. Stres jest jednym z ważnych czynników ryzyka mających wpływ na wyniki leczenia niepłodności i samoistne poronienia, dlatego ważnym jest zidentyfikowanie wszelkich czynników związanych tak z depresyjnością, jak i z zadowoleniem z życia niepłodnych par i tych po doświadczeniu poronienia.

Słowa kluczowe: depresyjność, niepłodność, poronienie, strategia przekształcenia znaczenia sytuacji, stres, zadowolenie z życia rodzinnego

Introduction

Although the majority of childless men and women highly appreciate the family and declare high motivation to have children (Testa, 2012), more and more couples in Poland remain childless (Młynarska, Rytel 2020; Młynarska, 2013). Among them there are couples who postpone procreation within or without a certain time perspective (Kalus & Szymańska, 2019; 2020). Many of them remain permanently childless. The reason for this may be the socio-economic situation and professional aspirations of young adults (Dembińska, 2019; Dorbritz, 2008). However, as the literature analysis shows, the most common cause of childlessness is infertility (Caselli et al., 2017; Koperwas, Głowacka, 2017; Guzikowski, 2009; Gawrych, 2015). WHO (2020) reports that the phenomenon of infertility affects about 10% of couples in the reproductive period in the world. In Poland, this disease affects 15 to 20% of couples of reproductive age (Stefanowicz, 2020). It is interesting to note that in highly developed countries primary infertility is dominant, while in developing countries secondary infertility is more common. Primary infertility refers to the inability to successfully conceive and give birth to a living child. Secondary infertility refers to the inability to achieve a second or subsequent pregnancy and childbirth in women or couples who were previously fertile (Kalus, 2014; Bielawska-Batorowicz, 2014). Research shows that 35% of infertility cases are caused by female, a similar percentage is attributed to male causes, 10% are causes resulting from disorders in both partners, and 20% is the so-called idiopathic infertility, i.e. without an indicated reason (Koperwas, Głowacka, 2017). Infertility is defined as "a disease that always affects two young people in the period of their greatest

activity, and its cause may lie with a man, a woman or both" (Koperwas, Głowacka, 2017, p. 32).

It is estimated that 8-12% of couples worldwide experience difficulties in conceiving a child, and about 10-15% of pregnancies end in miscarriage (Bręborowicz, 2015). Nowadays, the term miscarriage describes the loss of pregnancy until the 22nd week of its duration. It occurs through the expulsion of the fetal egg from the uterus, and its weight does not exceed 500g (Chu et al., 2020; Hendriks et al., 2019; Skrzypczak, 2015). This is a common phenomenon, as evidenced by the available estimates, which show that even 15-25% of all pregnancies may end unfavorably in its early stages (Laudański, 2020). It is a traumatic event that provokes the experience of grief, which can trigger symptoms of mental disorders: depression, anxiety disorders and PTSD (Guzewicz, 2014; Farren et al., 2016; Krosch, Shakespeare-Finch 2017). Experiencing loss together, partners' openness and a strong, lasting relationship allow partners not only to return to the state before the occurrence of a difficult event, but also to come out stronger (Hamama-Raz et al., 2010; Kiełek-Rataj et al., 2020; Hiefner, 2021).

1. Experience of Infertility or Miscarriage and Mental Health and Relationship Satisfaction

Fertility problems are believed to affect physical and mental health in all cultures and societies (Greil, Slauson-Blevins, & McQuillan, 2010). Couples struggling with infertility and those after a miscarriage experience many types of stressors, many anxieties related to the infertility treatment process itself, and the greatest threat for them is the loss of hope for parenthood (Kiełek-Rataj et al. 2020; Farren et al., 2016; Krosch, Shakespeare-Finch 2017). Infertility and the process of its treatment may threaten the feeling of control over the course and outcome of treatment, as well as violate the sense of privacy in the details of the couple's intimate life. When faced with stress related to infertility, women react with anxiety and a lower quality of life (Rooney & Domar, 2018), anxiety, depression and regret (Amini, Ghorbani, Afshar, 2020; Galhardo, Alves, Moura-Ramos, & Cunha, 2020).

Pregnancy loss is a traumatic event, often followed by a state of mourning. An orphaned mother may experience emptiness, anger and regret accompanied by physical symptoms such as pressure and breathing disorders, and difficulty sleeping. It is a natural response to the loss of a loved one and an attempt to come to terms with this situation (Libera, 2009; Krosch, Shakespeare-Finch, 2017). Miscarriage exceeds the resources and capabilities of the person experiencing it, which can lead to the feeling of strong tension and the breakdown of the ability to cope with stress, affecting all areas of everyday functioning (Lipczyński, 2007). Problems in the partners' conversation about loss and inadequate assessment of mutual needs disturb communication and relationship satisfaction, making it

difficult to recover (Bielan et al., 2010). Women are more likely than their partners to develop mental disorders as a result of the symptoms they experience, the most common of which are anxiety disorders, depression and PTSD (Farren et al., 2018). Difficulties in managing the experienced crisis result from the nature of the perceived loss. People for whom the miscarriage was associated with the loss of the expected child may feel the lack of mementos that would allow them to get used to the loss, and serve as proof of the existence and reality of the mourned loved one (Baranowska, 2017).

Experiencing a miscarriage can evoke intense emotions related to a lost child and lost motherhood (Ockhuijsen, van de Hoogen, Boivin, Macklon, de Boer, 2014). After experiencing a miscarriage, couples face three different waiting periods: (1) from loss of pregnancy to attempted conception, (2) between trying to conceive again and conception, and (3) between conception and confirmation that the pregnancy is safe. Medical waiting periods, which have been defined as those during which patients wait for test results that could potentially endanger their well-being (Boivin & Lancaster, 2010) appear to have a clear emotional signature. Waiting periods are a source of stress for the couple because the outcome of each is unpredictable and difficult to control (Boivin & Lancaster, 2010), and predicting loss causes increased anxiety and a prolonged state of mental suffering (Thiemann & Thiemann, 2020). Losing a desired pregnancy evokes helplessness and fear, and can lead to both immediate and long-term stress reactions, such as guilt, sadness (Chu et al., 2020; Robinson, 2014). It can also coexist with other psychological factors, such as anxiety and depression (Kiełek-Rataj et al. 2020), emotional disorders of a chronic, acute or transient nature (Musters et al., 2013), which is associated not only with the low quality of life of women after a miscarriage (Tavoli et al., 2018), but at the same time a significantly higher risk of another miscarriage (Qu et al., 2017; Terzioglu et al., 2016).

2. Infertility and Miscarriage as Dyadic Experiences

Although women want children more than men (Alosaimi et al., 2017), they suffer the consequences and suffering of infertility more acutely than men (Cserepes, Kollár, Sápó, Wischmann, Bugán, 2013; Kim, Shin, Yun, 2018) and experience more emotionally grief and depressive symptoms after a miscarriage (Chen, Chang, Kuo, Chen, 2020; Huffman, Schwartz, Swanson, 2015; Nagórska, Bartosiewicz, Obrzut, Darmochwał-Kolarz, 2019), however, both problems are dyadic in nature. Experiencing fertility problems in marriage is a complex process that can either strengthen or worsen family relationships (Kiełek-Rataj et al. 2020). The problem of infertility may lead partners to question the purpose and meaning of the relationship, it may arouse extreme emotions of resentment, rage, guilt and shame (Luk, Loke, 2015). Infertile women often involve their spouses in the treatment process to feel that the partner is in control of everything and seek the partners' support, which contributes

to lowering the level of depression (Kiełek-Rataj et al. 2020). Men, on the other hand, may experience infertility, in the context of their own self-esteem, indirectly based on how their infertility is perceived by their partner and how it affects her well-being (Farren et al, 2016; 2018). The sense of responsibility of men and the support they provide to partners during the fertility treatment process, positive dyadic coping with this situation can reduce the stress associated with treatment and reduce depressive symptoms (Chaves, Canavarro, Moura-Ramos, 2018). The approach to male, not female infertility is essential to the marital satisfaction of both partners (Farren et al, 2018). Women who have their husbands' support in the fight against infertility experience four times less suffering than women who feel lonely in this process (Patel, Sharma, Kumar, & Binu, 2018). Partner's support has also been recognized as an important predictor of adaptation to infertility, especially in infertile men (Martins, Peterson, Almeida, Mesquita-Guimarães, Costa, 2014). Infertility may also lead to strengthening the bonds of partners, better communication and satisfaction (Ferreira, Antunes, Duarte, & Chaves; 2015; Onat, Beji, 2012).

In the case of loss of pregnancy, depressed mood, increased anxiety and depression may last up to a year after the miscarriage (Chu et al. 2020; Farren et al. 2018), which certainly affects the mutual relations between partners (Kiełek-Rataj et al. 2020). Women facing miscarriage require social and emotional support (Fernández-Basanta, 2019; Chen et al., 2018). Many of them admit that their partner is their primary source of strength (Horstman, Holman, 2018). Men mourn less intensely than their female partners (Fernández-Basanta, 2019). Their main challenge is dealing with the sadness of their partners, which often leads to frustration (Fernández-Basanta, 2019; Desjardins, Stephenson, 2012) and helplessness resulting from the feeling that men's primary role is to support their wives after loss (Wang, Chen, 2010). At the same time, they report poorer quality of communication and sex life (Chu et al. 2020). Men rarely raise the topic of miscarriage openly, unless with another person with a similar experience or planning further pregnancies with their female partner, but they do so reluctantly (Meaney, Corcoran, Spillane, & O'Donoghue, 2017). Research results suggest that open communication, sharing thoughts and feelings, effective listening, showing caring and empathy can help a grieving woman transform sadness into an experience of personal development (Tian & Solomon, 2018), and at the same time help both partners to make sense of their joint loss (Horstman & Holman, 2018).

3. Coping Strategies with Infertility or Miscarriage

Earlier studies emphasized that the process of adaptation to an aversive event consists of a primary appraisal, i.e. the assessment of the possibility of modifying the situation in order to reduce its negative impact on the individual, and a secondary appraisal, i.e. the assessment of the possibility of modifying circumstances in order to better adapt to

them. In particular, secondary appraisal may include various strategies to try to assign meaning based on past experiences, redefine situations, anticipate future events to avoid disappointment and pain, assign control to another person, and identify protective factors that would avoid aversive situations in the future (Farren et al., 2019; Kiełek-Rataj et al., 2020).

Personal assessment of the importance of the problem has a significant impact on the psychological well-being of people, especially in the face of suffering and difficult life events such as infertility (Gourounti et al., 2010). It turns out that seeking social support is only helpful in some areas of stress related to infertility (Martins et al., 2011; Martins et al., 2013). In many societies, infertility and the resulting childlessness are stigmatized and lead to feelings of guilt (Jansen & Onge, 2015, Patel et al., 2018). Despite the prevalence of infertility, women often do not share their stories out of shame, guilt, and low self-esteem (Rooney & Domar, 2018). Sometimes the support of family and friends, who usually already have children, is perceived as inappropriate and is not readily accepted (Guzewicz, 2014). Similarly, in the case of couples suffering from miscarriage, in whom there is a greater need to feel safe and in control than to openly share their experiences (Farren et al., 2016; 2018). Despite the undeniable benefits of social support, it is also worth focusing on other strategies that may turn out to be more effective for couples in some situations. There are a number of infertility stress management strategies used by infertile couples. Women most often choose passive strategies, i.e. those focused on emotions, such as conversations, religious rituals, and avoidance strategies or waiting for a miracle (Alosaimi et al., 2017; Karaca, Unsal, 2015; Onyedibe, Aliche & Ugwu, 2019), while men prefer active strategies, i.e. focused on the problem (Mohammadi, Samani, Navid, Maroufizadeh, Sabeti, 2018). Passive coping turned out to be a positive predictor of stress (Chu et al. 2020), a higher level of anxiety and depression (Lechner, Bolman, & Van Dalen, 2007), while active coping was a negative predictor of stress (Van den Broeck, D'Hooghe, Enzlin, Demyttenaere, 2010) and positive improved overall well-being (Bayley, Slade & Lashen, 2009). The selection of strategies for coping with the problem of infertility, in addition to gender, turns out to be related to the level of perceived stress and the perception of infertility as a loss or as a challenge. Women struggling with the problem of infertility experience high anxiety, uncertainty and lack of control (Dana, Narimani, Mikaeili, 2013; Yazdani, Kazemi, Fooladi, & Samani, 2016), which is associated with more frequent use of avoidance strategies, self-blame, denial and distraction (Gourounti et al., 2012, Iordăchescu et al., 2021, Zurlo, Della Volta, Vallone, 2020) and perceiving the problem of infertility as a loss (Kalus, 2014). Also, infertile men with higher levels of stress most often adopted blame and avoidance strategies (Babore, Stuppia, Trumello, Candelori, Antonucci, 2017, Nagórska, Obrzut, Ulman & Darmochwał-Kolarz, 2021). Women with lower levels of stress, who assessed infertility as a challenge, used the strategies of positive reframing, sense of humor, emotional or instrumental support to a

greater extent (Benyamini, 2008, Nagórska et al., 2021). Additionally, in the context of the perceived greater potential benefits of experiencing infertility, women reported better emotional well-being (Bayle, Slade, & Lashen, 2009).

Women with a history of miscarriages more often use strategies focused on the problem than on emotions (Côté-Arsenault, 2007), they seek information and support (Andersson, Nilsson, Adolfsson, 2012), or positive assessment strategies (Ockhuijsen et al., 2014), which it can be adaptive, although it requires a radical reevaluation of life goals. Research indicates the negative impact of passive strategies and the positive impact of active coping strategies on the level of perceived stress (Casu, Zaia, Fernandes Martins, Parente Barbosa, Gremigni, 2019).

4. Research Goal

Couples' responses to infertility and miscarriage appear to be extremely varied, and factors favoring more adaptive coping still need to be identified. The search for meaning is almost ubiquitous and is judged to be very important in understanding and dealing with the event. Therefore, our study attempts to explain the relationship between the depressiveness of infertile couples and the experience of miscarriage and their life satisfaction, taking into account the mediating role of reframing the meaning of the situation, which refers to the ability of partners to redefine stressful events to make them more manageable (Canon, 2017).

Both the diagnosis of infertility and the experience of miscarriage may be a great challenge for a marriage, requiring the reconstruction of the values, goals and needs of marriage (Kielek-Rataj et al. 2020). It is a process that can significantly burden relationships (Berghuis & Stanton, 2002, Swanson et al., 2003) and cause deep depression, anxiety and depression (Swanson et al., 2007). Therefore, it was expected that the lowered mood of partners from both groups (infertile and post- miscarriage) would translate into lower satisfaction of the spouses with family life. Finally, a cognitive coping strategy, such as reframing, will modify the perception of a stressful event, such as infertility and miscarriage, to such an extent that it will translate into the level of managing difficult emotions and, consequently, higher family life satisfaction .

Our study included spouses who experienced prenatal loss of a child and spouses with diagnosed infertility. Significant relationships were expected between partners' depression, their use of strategies to transform the meaning of the situation, and family life satisfaction. The variables of both partners are considered correlated dyadic variables, therefore we used the actor-partner interdependence model (APIM, Kenny, Kashy, & Cook, 2006) to understand the processes in the relationship between two people in a relationship experiencing the same stressor. Taking into account the intercorrelation of dyadic data, proposed by Kenny (1996), APIM (Fig. 1) simultaneously estimates (1) the effect of wife and

husband' depressiveness on their own family life satisfaction (actor effect) and (2) the effect of wife and husband' depressiveness for mutual family life satisfaction (partner effect).

Hypothesis 1 (H1) The depressiveness of partners predicts their lower family life satisfaction (actor's effects)

Hypothesis 2 (H2) Partners whose spouses have higher depressiveness scores report lower family life satisfaction (partner effects).

We also analyze whether the strategy of reframing effects the relationship between the spouses' depressiveness and their family life satisfaction :

Hypothesis 3 (H3): The use of reframing strategy by partners weakens the relationship between their depressiveness and family life satisfaction .

The present study is part of a larger research project aimed at understanding how the family system works in the face of child loss.

5. Research Method

5.1. Study group

The study involved 90 married couples (N = 180): 50 couples after miscarriage and 40 couples diagnosed with infertility. The criteria for qualifying for the study were the experience of infertility or miscarriage and being married. The mean age for women after miscarriage was 35.12 (*SD* = 7.55), and for men 36.92 (*SD* = 7.34); for women with infertility 34.70 (*SD* = 7.88), and for men 36.93 (*SD* = 7.48). The mean duration of the relationship of couples after miscarriage was 11 years (*SD* = 8.07), and of couples with infertility was 9.23 (*SD* = 6.81). Among couples who had a miscarriage, 74% already had children from previous pregnancies. 92% of infertile couples were childless.

5.2. Research procedure

The study was conducted in the Opolskie and Śląskie voivodships. Access to the surveyed persons was possible through gynecologists, midwives and nurses working in gynecology and obstetrics departments. After the candidates gave their consent, they were contacted by phone. Each couple who agreed to the test met individually, usually at home. The respondents then received two packages of questionnaires in envelopes, which they could seal after filling in. The respondents completed the questionnaires at home, without the researcher being present. The researcher then made an appointment to collect the completed questionnaires and spoke to respondents if they so requested. A total of 103 married couples were examined, but data from 13 couples was rejected due to numerous deficiencies in the spouses' surveys. All participants were informed that the study was confidential and that they could withdraw from it at any time. All respondents gave their

informed consent to participate in the study. The study was conducted in accordance with the Declaration of Helsinki.

5.3. Measures

The demographic questionnaire authored by the researchers was used to collect data, including age, gender, marriage duration and relationship type, number of children, employment status, level of education, infertility data (e.g., were you or your wife / husband treated for infertility?) and miscarriage (e.g. pregnancy?)

The FACES IV scale (Flexibility and Cohesion Evaluation Scales, Olson, 2011), adapted from Margasiński (2013), consists of 62 items forming 8 scales: balanced cohesion and balanced flexibility, disengaged, enmeshed, rigid and chaotic, followed by family communication and satisfaction with family life scale. In our analyzes, we used the family life satisfaction scale. The reliability of the tool, measured by the Cronbach's alpha value in our study, for the family life satisfaction scale was 0.93.

The Giessen test (Januszewski, 1992) is used to assess one's own image as well as the image of a spouse or partner. It consists of 40 items to which the respondents refer on a scale from -3 to +3, where 0 is a neutral value. The test items consist of 6 scales: social resonance, pliancy, control, depressiveness, openness, and social potency. For the purposes of this article, analyzes are presented limited to the depressiveness dimension, characterized as a state of depression, high reflectiveness, high level of anxiety and fear, as well as self-criticism, suppression of anger and dependence. Cronbach's alpha value for the depressiveness scale in our study was 0.60.

The Family Crisis Questionnaire (F-COPES; McCubbin, Olson & Larsen, 1981) is a 30-item self-report questionnaire designed to assess the family's coping with stress. The respondents refer to the given statements by marking on the 5-point Likert Scale from "I strongly disagree" to "I strongly agree". It consists of five subscales: acquiring social support, seeking spiritual support, mobilizing family to acquire and accept help, passive appraisal, and reframing. The analyzes used the subscale reframing understood as a redefinition of a difficult situation, an attempt to give it a different, acceptable meaning. Cronbach's alpha for the transforming the significance of the situation was 0.60. The method is the Polish version of D. H. Olson's tests developed by Radochoński (1987).

5.4. Analysis strategies

Means with standard deviation were calculated for all variables. Pearson's correlations were used to test the intercorrelation matrix between the variables, and the *t*-test for dependent samples was used to analyze the differences between the sexes in the variables. Correlations for each variable between males and females assume nonindependence of dyad scores (Cohen, Schulz, Weiss, & Waldinger, 2012). The variables of

both partners are considered to be a common dyadic construct, therefore the actor-partner interdependence model (APIM) (Kenny, 1996) was used for the analysis, taking into account the interdependence of dyadic data. All analyzes were performed as part of Structural Equation Modeling (SEM; Mueller & Hancock, 2010) using the lavaan package. To investigate the differences between the sexes, the difference between the actor's effects in a woman and in a man was calculated, as well as the difference between the effects of a partner in a woman and a man (Kenny & Ledermann, 2010). All tests were performed at the significance level of 0.05. A hypothetical model was assessed using goodness-of-fit indices that included chi-square and the root mean square error of approximation of the sample to the ideal population (RMSEA; acceptable fit ≤ 0.08) (Hu, Bentler, 1999).

6.Results

The minimum sample size necessary to detect the actor and partner effects for APIM analysis at the assumed power level of 0.80 and alpha 0.05 is 91 diads (APIMPower; Ackerman, Ledermann, and Kenny, br). Our sample consists of 90 dyads, so we can conclude that despite the relatively small number, it is still a sufficient number for APIM analysis. Means, standard deviations, and the paired *t*-test examining differences between the sexes are presented in Table 1.

Table 1. Descriptive statistics and gender differences

	Men		Women		<i>t</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Depressiveness	22,47	4,68	27,31	5,13	6,82***
Family life satisfaction	38,94	6,46	37,86	8,12	-1,61
Reframing	26,67	3,87	25,92	4,98	-1,62

n = 90 dyads; **p* < .05; ***p* < .01; ****p* < .001

The results of the *t*-test (Table 1) showed that there were no significant differences between the sexes in terms of satisfaction and reframing. Women obtained significantly higher results than men on the depressiveness scale. Comparing the groups of infertile couples and those after miscarriage (Table 2), we observe that there were no differences between men and women from both groups in terms of depressiveness, however, infertile women and men had significantly higher scores on the life satisfaction scale than men and women after miscarriage. The reframing strategy is more often used by infertile women than women after a miscarriage. The spouses' results correlate significantly in terms of the use of the reframing strategy and life satisfaction, but not in terms of depressiveness (Table 2).

Table 2. Descriptive statistics and t-test results for infertile and post-miscarriage couples

	Men		Women		<i>t</i> Men/ Women
	Infertility	Miscarriage	Infertility	Miscarriage	
	<i>M/SD</i>	<i>M/SD</i>	<i>M/SD</i>	<i>M/SD</i>	
Depressiveness	21,92/4,76	23,15/4,54	26,56/4,73	28,25/5,50	-1,24/-1,57
Family life satisfaction	40,56/6,34	36,92/6,11	40,46/7,22	34,6/8,08	2,75**/3,63***
Reframing	26,9/4,16	26,38/3,51	27,12/5,24	24,43/4,25	0,64/2,63**

n = 40 infertile dyads i *n* = 50 post-miscarriage dyads. **p* < .05; ***p* < .01; ****p* < .001

Both in the case of men and women, there were few weak and moderate correlations between the studied variables (Table 3). The reframing strategy in women positively correlates with their own life satisfaction, while the use of this strategy by men is associated with their own and their partners' life satisfaction. The depressiveness of both spouses negatively correlates with the satisfaction with their own and their partners' lives.

Table 3. Intercorrelations between the variables for women (_A) and men (_P)

		1	2	3	4	5	6
1	Reframing_A	1					
2	Family life satisfaction _A	,29**	1				
3	Depressiveness _A	-0,14	-,23*	1			
4	Reframing_P	,54**	,23*	-0,14	1		
5	Family life satisfaction _P	0,16	,64**	-0,08	,36**	1	
6	Depressiveness _P	-0,10	-,34**	0,06	-,21*	-,43**	1

Correlations between spouses are shown in bold diagonal font; *n* = 90 dyads; **p* < 0,05; ***p* < 0,01

The spouses are statistically distinguishable on the basis of gender (chi square (6) = 117.99, *p* < 0.001) (Kenny, Kashy, & Cook, 2006). The variables were centered to the mean to avoid the multicollinearity effect (Aiken & West, 1991). In Model 1 (Table 4), which is the base APIM (Fig. 1), we examine the relationship between depressiveness and family life satisfaction. Two hypotheses are tested:

H1: Depressiveness predicts lower family life satisfaction (actor effects)

H2: Partners whose spouses show higher depressiveness experience lower family life satisfaction (partner effects)

As predicted (H1), in both men and women, we observe significant negative actor effects of the depressiveness on family life satisfaction. The partner effect turned out to be statistically significant only for women, which partially confirms our hypothesis (H2) about the negative effect of partner depressiveness on the spouse's family life satisfaction.

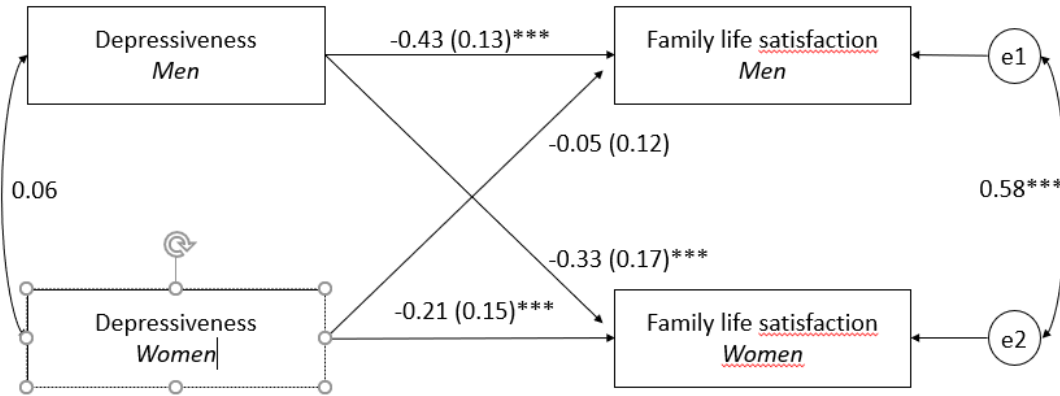


Figure 1. Depressiveness and life satisfaction in infertile and post-miscarriage couples. Rectangles represent independent and dependent variables; two circles represent the residual variables (e1, e2: residual errors on family life satisfaction for men and women, respectively); the arrows describe the actor and partner effects. The two-headed arrows on the left show the covariances between the independent variables; The double-headed arrow on the right shows the correlation between the two residual variables; standardized coefficients (β) are given with the standard error in parentheses. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$;

There were no significant differences between the actor effects ($p = 0.22$) or partner effects ($p = 0.57$), indicating the same pattern in both sexes. The difference between partners' intercept was -0.39 ($p = .63$, 95% CI [-1.98, 1.2]); the partial interclass correlation between the results of family life satisfaction for both spouses in the context of predictors was 0.58 ($p = <.001$, [0.27, 0.64]). Therefore, if one of the partners achieves a high / low score on the family life satisfaction scale, resulting from his / her own and spouse's depressiveness, the other partner also shows a high / low score on the family life satisfaction scale.

Table 4. Effects of partners' depressiveness on family life satisfaction

	Effects	Estimates	95% CI	p	Beta	r
Model 1	<i>Women</i>					
	Intercept	37.29	35.41 to 39.18	<.001		
	Actor	-0.34	-0.64 to -0.04	.029	-0.21	-0.23
	Partner	-0.57	-0.90 to -0.24	<.001	-0.33	-0.34
	<i>Men</i>					
	Intercept	37.68	36.21 to 39.16	<.001		
Model 2	<i>Women</i>					
	Intercept	29.49	22.04 to 36.94	<.001		
	Actor	-0.23	-0.51 to 0.06	.119	-0.15	-0.23
	Partner	-0.48	-0.79 to -0.17	.002	-0.32	-0.34
	<i>Men</i>					
	Intercept	27.19	20.14 to 34.24	<.001		
Actor	-0.48	-0.72 to -0.24	<.001	-0.32	-0.43	
Partner	0.02	-0.20 to 0.24	.879	-0.01	-0.06	

The family life satisfaction of women after a miscarriage is on average 3.90 ($p = 0.011$), and of men 2.84 ($p = 0.014$) lower than the family life satisfaction of infertile women and men. In model 2 (Table 4), the relationship between partners' depressiveness and family life satisfaction is moderated by the spouses' reframing strategy. The effect of applying the reframing strategy turned out to be significant for both women ($\beta = 0.37$; $p = 0.006$, 95% CI [0.103, 0.629]) and men ($\beta = 0.443$, $p < 0.001$, 95% CI [0.186, 0.701]). When controlling for covariates, the actor effect for men and the partner effect for women weakened somewhat, but still remained significant, while the actor effect for women turned out to be statistically insignificant. This means that the reframing strategy used by partners in both studied groups significantly weakens the relationship between their depressiveness and the level of satisfaction with life. Especially in the case of women, the effect of their own depressiveness on family life satisfaction ceases to be significant in the context of the reframing strategy used by both spouses. The fit of the model to the data turned out to be satisfactory (Chi-square = .16; RMSEA = .00).

1. Discussion

Both the diagnosis of infertility and the experience of miscarriage have a significant impact on the quality of life of married couples, mainly from an emotional and social perspective. The aim of this study was to analyze the relationship between the depressiveness of infertile partners and couples after a miscarriage and the ways of coping with the problem in the context of their family life satisfaction .

We observe a strong negative relationship between the depressiveness of both spouses and their satisfaction with family life (H1). Women obtained significantly higher scores on the depressiveness scale than men, which confirms the results of other studies reporting higher emotional costs of women compared to men related to infertility (Cserepes et al., 2013, Kim et al., 2018) and the experience of miscarriage (Chen et al., Nagórska et al., 2019). However, the higher level of women's depressiveness did not translate into their husbands' family life satisfaction. The partner's depressiveness effect was significant only in the case of women (H2). This is in line with previous research suggesting that partner traits have a stronger effect on women than on men (eg Lyons, Sullivan, Ritvo, & Coyne, 1995). Other studies confirm that among men, personal competences are more important in coping with stress than spouse's support, while for women, spouse's support is the most important (Benyamini, Gozlan, & Kokia, 2009). Our analyzes have been limited only to reframing strategy, but it can be assumed that men who cope with stress on their own at the cognitive level also have a greater potential to support their wives, which translates into higher life satisfaction. The reframing strategy used by partners in both studied groups significantly

weakens the relationship between their depressiveness and the level of family life satisfaction (H3).

The effect of own depressiveness on family life satisfaction ceases to be significant in the context of the reframing strategy used by both spouses, especially in the case of women. Uncontrolled stress leads to a higher level of anxiety than controlled stress (Berg, Upchurch, 2007). Higher control is associated with greater use of cognitive restructuring (Frazier, Mortensen, & Steward, 2005). Research shows that people are prone to experience positive changes in the psychological sphere if they can give meaning to a difficult experience (Neimeyer, Baldwin, & Gillies, 2006). It turns out that even in the situation of significantly higher results on the depressiveness scale in women, the use of a positive reframing of the experienced problem by both women and their husbands is so effective that it reduces the impact of depressiveness, leads to stress reduction and greater life satisfaction (Nagórska and in., 2021, Zurlo, Della Volta & Vallone, 2020).

At the same time, infertile women and men achieved significantly higher results on the life satisfaction scale than women and men after experiencing a miscarriage. This may be associated with more frequent use of the reframing strategy by infertile women than women after miscarriage, which would additionally confirm the effectiveness of the strategy used. At the same time, it is worth mentioning that in women after a miscarriage, but also in their partners, clinically significant levels of anxiety, depressiveness and symptoms of post-traumatic stress were found (Farren et al., 2021), which persisted even 12 months after the loss (Meaney et al., 2017), which confirms the severity of the problem and may explain the lower level of family life satisfaction of partners who experienced a miscarriage.

This study has several strengths, which undoubtedly include the selection of groups of respondents struggling with the problem of infertility and miscarriage. Both phenomena constitute a huge confession to the modern world, especially in the era of the unprecedented COVID-19 pandemic, which not only affects the economy and the general functioning of societies (Vaughan, Shah, Penzias, Domar, Toth, 2020), but is also an additional significant stressor, the negative consequences of which may also affect couples treating infertility and increase the risk of miscarriage (Qu et al., 2017, Terzioglu et al., 2016). Another strength that should be emphasized is the dyadic nature of the research. Thanks to APIM analyzes, it was possible to study the effects of partners' depressiveness on their family life satisfaction, taking into account the reframing strategy, while controlling for the spouse's depressiveness and reframing strategy (Kenny, 1996).

Conclusions and limitations

Our results indicate a strong relationship between the depressiveness of infertile and post-miscarriage spouses and their family life satisfaction. At the same time, they underline the importance of a reframing strategy applied by both partners.

Contemporary medical knowledge confirms that infertility may also have a psychogenic basis (Wass, Stewart, 2011). Many authors indicate that infertility and miscarriage are phenomena burdened with severe stress (Rooney, Domar, 2018, Boivin, & Lancaster, 2010), which not only reduces the life satisfaction of infertile spouses (Galhardo et al., 2020) and after miscarriage (Tavoli et al., 2018), but is also associated with poorer effects of infertility treatment (Rooney & Domar, 2018) and is a significant risk factor for miscarriage (Chen et al., 2019, Qu et al., 2017). Therefore, there is a great need for professional psychological help offered to infertile couples and after experiencing a miscarriage, according to individual needs, using modern techniques of modern medicine (Greil et al., 2010, Lafarge, Kathryn Mitchell, Fox, 2017). Male involvement in the infertility treatment process is also of particular importance (Chaves et al., 2018) and in particular waiting periods related to miscarriage (Swanson et al., 2003).

Among the limitations of the presented study, its cross-sectional nature, which makes it impossible to infer causal relationships between the analyzed variables, should be mentioned. Future longitudinal studies will allow the presented analyzes to be deepened. Another limitation is the relatively small group of respondents, which does not allow separate analyzes of both groups, or advanced analyzes distinguishing, for example, the cause of infertility / miscarriage, which could significantly affect the perception of the problem by spouses (Benyamini et al., 2009), having children, which is known to be a protective factor (Volgsten, Jansson, Skoog Svanberg, Darj, Stavreus-Evers, 2018), or the number of previous miscarriages or the duration of fertility treatment, which translate into higher rates of depressiveness (Chen et al., 2020, Volgsten et al., 2018).

There is no doubt that studying the consequences and determinants of coping with the situation of infertility and miscarriage is of great importance for understanding the problems and needs of spouses struggling with these difficult experiences and for appropriate support. Bearing in mind that the number of spouses who cannot have children is systematically increasing, it is worth looking for ways to effectively help and support them at various stages of coping with these traumatic situations, as well as in the pursuit of having children.

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