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The Dynamics of Marital Relations and Parental Attitudes in Families Who Conceived the Child Through in Vitro Fertilization

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Abstract: **Introduction**. The growing prevalence of assisted reproductive technology leads to an increase in the research interest in the psychological characteristics of families who have conceived a child through in vitro fertilization (IVF), as a significant factor contributing to child's health and development. However, there are some deficits and contradictions in the available data. The study is aimed at identifying the specifics and dynamics of marital relations, parental attitudes and the mental well-being of the spouses who conceived the child through IVF, during the pregnancy and child's infancy. **Methods**. Participants were 250 married couples: 160 couples with natural pregnancy (NC), and 90 couples with induced pregnancy (IVF). Marital relations, parental attitudes and mental well-being as the affective component of relations were assessed via a set of psychodiagnostic instruments during the pregnancy and at the child's infancy. **Results**. Most characteristics of marital relations did not differ significantly across the NC and IVF groups at both research waves. Parental attitudes were significantly more positive in the IVF than in the NC families, indicating high value of parenthood. During the pregnancy, two types of families were identified in both groups: "Marital and parental well-being" (58 %) and "Marital discord and a high value of parenthood" (42 %) in the main group, "Marital and parental well-being" (67 %) and "Difficulties in marital relations and parental attitudes" (33 %) in control group. Characteristics of these types of families remained stable during the child's infancy. **Discussion**. The results suggest that marital relations are not significantly associated with the method of conception, and the observed tendencies are mostly related to the critical periods in family life cycle. In contrast, parental attitudes in IVF families have special characteristics, e.g. the high value of parenthood that is relatively independent of other aspects of family functioning. The results can be used in the process of psychological support for families with induced pregnancy.

Keywords: marital relations, family relations, parental attitudes, parenting, in vitro fertilization, infertility, IVF, ART, motherhood, fatherhood

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Highlights:

- Based on the characteristics of marital relations and parental attitudes, two types of families with induced pregnancy were identified: "Marital and parental well-being" and "Marital discord and a high value of parenthood". The characteristics of these types were stable during the pregnancy and child's infancy.
- No significant differences in most aspects of marital relations were observed across the NC and IVF groups.
- High value of parenthood was identified as one of the key aspects of relationships in families who conceived the child through IVF.

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Introduction

Currently, the prevalence of the reproductive health problems is increasing. According to the latest statistics, more than 15 % couples in the world have been diagnosed with infertility (Simionescu et al., 2021). In 40 % of couples the infertility is caused by the female factor, in 30 % – by the male factor, and in 30 % of couples it is caused by the reproductive problems of both partners (Dyachkova, 2013). Therefore, in a large number of psychological studies, partners are studied separately in order to investigate the psychological characteristics of women or, more rarely, men with reproductive disorders. Thus, it was found that women with infertility have higher levels of stress, anxiety and depression (Zybailo et al., 2015; Yusuf, 2016). For men, the infertility is also a traumatic experience (Hanna & Gough, 2020), causing the feeling of being unsuccessful in family, social and professional relationships (Hadley & Hanley, 2011). However, irrespective of the factor causing infertility, the reproductive problems are considered to be a stressful experience, that affects marital relationships and contributes to an increase in psycho-emotional stress in the family (Ying et al., 2015).

Assisted reproductive technology (ART), and particularly in vitro fertilization (IVF), are considered as the most effective method of infertility treatment. The prevalence, availability and efficacy of ART is increasing, therefore, there is a special growing category of families – families that conceived a child through ART. In such families, the stressful experience of having reproductive problems is accompanied by stress associated with fertility treatment (Miller et al., 2019), which also affects marital relations and parental attitudes. Other psychological characteristics of such families include the strong desire to have a child, and the perception of assisted reproductive technology as a way to overcome the reproductive health problems.

However, there is a lack of data on the characteristics of marital relations and parental attitudes in families who have conceived a child through IVF. Most research was conducted on a female sample, and there is a limited number of studies investigating the psychological state of men during the IVF treatment (Gardanova et al., 2021a). The characteristics of marital relations in couples undergoing infertility treatment include: the moderately balanced type of relations (Gardanova

et al., 2021b); women's dissatisfaction with marital relations (Blake et al., 2012; Darwiche et al., 2015), with no difference for fathers (Blake et al., 2012); the decrease in marital congruence and satisfaction after childbirth, with initial relationship satisfaction (Gameiro et al., 2011; Cairo et al., 2012). The absence of significant differences in the quality of marital relations associated with the conception type was also reported (Cebert et al., 2019).

The parental attitudes towards the child conceived through IVF was shown to be characterized by: high maternal expectations from the child (Solovyova, 2014), from themselves and others (Mohammadi et al., 2015); mothers' tendency to express overprotection and permissive parenting style (Dueva, 2014; Mohammadi et al., 2015); excessive positive emotionality during the pregnancy and overestimation of own parental skills, with a tendency to have codependent relationships with the child (Malenova & Kytkova, 2015); unconditional acceptance of the child and the desire to establish the bodily contact with them, with lower support of child's initiative (Yakupova & Zakharova, 2016); and an overall warmer attitude towards the child compared to families who conceived naturally (Fata et al., 2021; Paterlini et al., 2021).

The affective aspects of relations in families with induced pregnancy, especially maternal anxiety and depression, were actively studied. The data are contradictory: high levels of trait anxiety and depression (Naku et al., 2016); low levels of state and trait anxiety, and a high level of anxiety associated with pregnancy (McMahon et al., 2013); hyperthymia and impulsivity, euphoric attitude towards childbirth and anxious attitude towards pregnancy (Kocherova et al., 2016). The presence of increased anxiety and depression was also observed in men participating in the ART program (Gardanova et al., 2021a), as well as the relationship between parental well-being and the time to pregnancy (Jongbloed-Pereboom et al., 2012). No significant differences in parental mental health in families with induced vs natural pregnancy were observed after childbirth (Caparros-Gonzalez et al., 2019).

All in all, the data on the characteristics of relationships in families with induced pregnancy are contradictory. Also, there is a lack of data on the psychological characteristics of fathers, as well as an integral family system. All this emphasizes the need for comprehensive longitudinal studies aimed at investigating the problems indicated above. This present study was aimed at identifying the characteristics and dynamics of marital and parental relationships in families who conceived a child through IVF, based on the comparative and typological approach.

Methods

Procedure

The data were a part of the prospective and longitudinal study of child development. Two assessment waves were included in the study: pregnancy and child's infancy (9 months), which reflected two stages of family life cycle, associated with a critical period. The recruitment of participants was conducted via partner clinics in Tomsk, Novosibirsk and Barnaul. The study was approved by the Ethical committee of interdisciplinary research.

Participants

The participants were 250 families: 90 families with induced pregnancy (IVF) and 160 families with natural conception (NC). Parents who conceived the child through IVF were significantly older than parents of the control group (mean age of NC mothers M = 28.96 (SD = 4.06), IVF mothers – M = 33.40 (SD = 4.90); NC fathers M = 31.01 (SD = 4.99), IVF fathers – M = 34.75 (SD = 5.50)).

Russian Psychological Journal, Vol. 19, No. 3, 41–55. **doi**: 10.21702/rpj.2022.3.3

Methods

The diagnostic booklets are based on the materials used in the large-scale longitudinal studies of childhood development: QLSCD (The Quebec Longitudinal Study of Child Development, Canada) and C-IVF (Cardiff IVF study, Great Britain). The questionnaires were translated and adapted for the Russian-speaking sample.

During the pregnancy the following characteristics were studied: 1) Marital satisfaction (Marital Adjustment Test, MAT) (Locke & Wallace, 1959); 2) Warmth and hostility in marital relations (Warmth and Hostility scale of The Iowa Family Interaction Rating Scales) (Melby & Conger, 2000); 3) Attachment to the fetus (Maternal Fetal Attachment Scale) (Cranley, 1981); 4) Stressful events in parents' life (The List of Threatening Experiences) (Brugha & Conroy, 1985); Life Event Scales for Obstetric Groups (Barnett et al., 1983); 5) The levels of anxiety, irritability and depression (The Irritability, Depression, Anxiety Scale (IDA)) (Snaith et al., 1978);

During the child's infancy we explored: 1) Level of happiness in the relationship (Happiness in the Relationship Scale of Marital Adjustment Test, MAT) (Locke & Wallace, 1959); 2) Warmth and hostility in marital relations (Warmth and Hostility scale of The Iowa Family Interaction Rating Scales) (Melby & Conger, 2000); 3) Family functioning (Family Functioning Scale of McMaster Family Assessment Device, MFAD) (Epstein et al., 1983); 4) Parental attitudes (parental self-efficacy, perceived parental impact, overprotection, warmth towards the child, hostile-reactive parental behavior, perception of infant's qualities of the Parental Perceptions and Behaviors Regarding the Infant Scale, PACOTIS) (Boivin et al., 2005); 5) Postpartum depression (The Center for Epidemiologic Studies Depression Scale, CES-D) (Poulin et al., 2005).

The statistical analysis was performed with IBM SPSS Statistics 26: descriptive statistics; Kolmogorov–Smirnov normality test, parametrical and non-parametrical methods of comparison (Mann–Whitney U test; Wilcoxon test), hierarchical cluster analysis. At the first stage of analysis the internal consistency of scales was tested with Cronbach's alpha coefficient. Several scales were excluded from the further analysis because of the low internal consistency ($\alpha < 0.6$): «Differentiation of self from the fetus» subscale of Maternal Fetal Attachment Scale; «Depression» and «Inward irritability» subscales of the Irritability, Depression, Anxiety Scale (IDA) Scale.

Results

Pregnancy

At the first step, the observed characteristics were compared between the parents of the IVF vs NC groups, as well as between mothers and fathers within each group. Marital relations in both groups were characterized by a high degree of satisfaction with the relationship, warmth, support, trust, and low conflict. The only measure that differed significantly between groups was the warmth expressed towards the partner, which was significantly higher in fathers from the IVF families compared to fathers from the NC families ($U = 4978.00$; $p = 0.04$; $r = 0.14$). In the NC families, the composite measure of marital satisfaction was significantly higher for mothers than for fathers ($z = 3.27$; $p = 0.00$; $r = 0.27$), which was not observed in IVF families.

The measures of the parental attitudes indicated the high level of attachment to the child in both parents, which was expressed in the interaction with them (touching the stomach, talking), the desire to take care of them, and the readiness to change the lifestyle. Parents from IVF families, compared with NC parents, performed higher levels of paternal ($U = 4988$; $p = 0.04$, $r = 0.13$) and maternal ($U = 4356.5$; $p = 0.00$, $r = 0.28$) behaviors, were more likely to imagine the child's

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feelings (mother: U = 5502.5; p = 0.04, r = 0.13; father: U = 4469.5; p = 0.00, r = 0.21) and were in general more attached to the child (mother: U = 4257; p = 0.00, r = 0.29; father: U = 4727; p = 0.01, r = 0.17); mothers often interacted with the fetus (U = 5165; p = 0.01, r = 0.17) and were more prone to self-sacrifice (U = 4117.5; p = 0.00, r = 0.31).

All measures of mental well-being did not differ significantly between the groups for both family members. Most participants experienced low levels of anxiety and irritability, indicated the low perceived levels of stress caused by events that took place in their lives over the past year. In both groups, mothers had higher level of anxiety than fathers (NC: Z = 4.05; p = 0.00; r = 0.33; IVF: Z = 2.90; p = 0.00; r = 0.24).

At the second step, the cluster analysis was performed, and two types of IVF and NC families with different characteristics of relations were identified.

The following types of IVF families were observed (table 1):

1. «Marital and parental well-being» (58 % of couples). Both parents were significantly more satisfied with marital relations, had positive parental attitudes, significantly higher mental well-being. Mothers had lower stress level.

2. «Marital discord and a high value of parenthood» (42 % of couples). Both parents were significantly less satisfied with marital relations, significantly lower mental well-being, and positive parental attitudes. Mothers had higher stress level.

Table 1

Significant differences in psychological characteristics of types of IVF couples during the pregnancy

Measures	Family member	Comparison	U/t	r
Marital satisfaction	M**	Type 1 > Type 2	356.50	0.46
	F**	Type 1 > Type 2	299.50	0.52
Warmth towards the partner	M**	Type 1 > Type 2	3.79	0.09
	F**	Type 1 > Type 2	5.86	0.53
Perception of partner's warmth	M**	Type 1 > Type 2	5.65	0.56
	F**	Type 1 > Type 2	199.00	0.63
Stressful life events	M**	Type 1 < Type 2	4.73	0.49
Anxiety	F**	Type 1 < Type 2	390.50	0.43

*Here and below: * significant at p < 0,05; ** significant at p < 0,01; M – mother, F – father; r – effect size.*

In NC families two types of families were also observed (table 2):

1. «Marital and parental well-being» (67 %). Both parents were significantly more satisfied with marital relations, had more positive parental attitudes and higher mental well-being.

2. «Difficulties in marital relations and parental attitudes» (33 %) was characterized by significantly lower marital satisfaction, less positive parental attitudes and lower mental well-being.

Table 2

Significant differences in psychological characteristics of types of NC couples during the pregnancy

Measures	Family member	Comparison	U/t	r
Marital satisfaction	M**	Type 1 > Type 2	1569.00	0.37
	F**	Type 1 > Type 2	6.16	0.48
Warmth towards the partner	M**	Type 1 > Type 2	729.50	0.61
	F**	Type 1 > Type 2	1306.00	0.45
Perception of partner's warmth	M**	Type 1 > Type 2	1163.00	0.49
	F**	Type 1 > Type 2	1231.50	0.47
Attachment to the fetus	M**	Type 1 > Type 2	1650.50	0.35
	F**	Type 1 > Type 2	1451.00	0.41
Stressful life events	M**	Type 1 < Type 2	2029.50	0.24
	F*	Type 1 < Type 2	2300.00	0.17
Anxiety	M**	Type 1 < Type 2	1134.50	0.50
	F**	Type 1 < Type 2	1827.00	0.30
Irritability	M**	Type 1 < Type 2	1210.50	0.50
	F**	Type 1 < Type 2	1999.50	0.26
Negative emotional states	M**	Type 1 < Type 2	710.00	0.62
	F**	Type 1 < Type 2	1666.50	0.35

Russian Psychological Journal, Vol. 19, No. 3, 41–55. **doi**: 10.21702/rpj.2022.3.3

Child's infancy

At this assessment wave, all characteristics of marital relations did not differ significantly between the IVF and NC parents. Most couples were satisfied with warmth and acceptance they experienced in marital relations, and perceived home as a safe place. No IVF family was included in the risk group for low quality of family functioning; in the control group, the proportion of such families was 2.3 %. In both groups, fathers reported a higher level of happiness experienced in relationships (NC: $Z = 2.92$; $p = 0.00$; $r = 0.24$; IVF: $Z = 2.21$; $p = 0.03$; $r = 0.25$), higher quality of interaction with the partner (E3: $Z = 4.65$; $p = 0.00$; $r = 0.39$; IVF: $Z = 2.64$; $p = 0.01$; $r = 0.29$), lower hostility towards the partner (E3: $Z = 5.19$; $p = 0.00$; $r = 0.43$; IVF: $Z = 2.07$; $p = 0.04$; $r = 0.23$), and a lower level of family functioning (E3: $Z = 2.61$; $p = 0.01$; $r = 0.22$; IVF: $Z = 2.22$; $p = 0.03$; $r = 0.25$).

For NC fathers, the perceived level of happiness was significantly higher compared to the first assessment wave ($\Delta M = 2.72$; $Z = 2.68$; $p = 0.01$; $r = 0.25$). In the IVF families, both spouses reported significantly lower warmth in relationships (mothers: $\Delta M = 2.63$; $Z = 4.23$; $p = 0.00$; $r = 0.50$; fathers: $\Delta M = 2.37$; $Z = 4.34$; $p = 0.00$; $r = 0.51$) and higher level of hostile behavior towards the partner (mothers: $\Delta M = 1.52$; $Z = 3.10$; $p = 0.00$; $r = 0.37$; fathers: $\Delta M = 0.93$; $Z = 2.50$; $p = 0.00$; $r = 0.30$) than during the pregnancy. For the NC mothers, the level of warmth significantly decreased ($\Delta M = 2.76$; $Z = 5.16$; $p = 0.00$; $r = 0.43$) and the level of hostility to the partner increased ($\Delta M = 2.06$; $Z = 4.26$; $p = 0.00$; $r = 0.36$). For fathers, only the decreased in warmth was statistically significant ($\Delta M = 0.94$; $Z = 2.54$; $p = 0.01$; $r = 0.21$).

Parental relations in both groups were characterized by a high degree of warmth, care, awareness of parents' importance for the child's development and feeling of being effective as a parent. Fathers from IVF families reported higher levels of perception of infant's qualities as exceptional, compared to NC fathers ($U = 5436.5$; $p = 0.01$; $r = 0.16$), both IVF parents treated their child with more warmth and care (mothers: $t = 2.27$; $p = 0.02$; $r = 0.16$; fathers: $U = 5421.5$; $p = 0.01$; $r = 0.17$) that NC parents.

Most parents of both groups reported low levels of postpartum depression. However, in both groups, a risk group of participants with increased level of depressive symptoms was identified: in IVF group – 4.4 % of mothers and 3.3 % of fathers, in the NC group – 18.7 % of mothers and 10.8 % fathers. The significant differences in postpartum depression scores between mothers and fathers were observed only in NC families: mothers were significantly more depressed than fathers ($Z = 4.14$; $p = 0.00$; $r = 0.35$).

In order to identify the dynamics of the typological characteristics of couples, we analyzed the differences in characteristics of marital relationships, parental attitudes and mental well-being between the family types.

In IVF families, all characteristics of marital relations were significantly higher for the first type of families than for the second one, except for fathers' happiness in relationships, that did not differ significantly between the types (Table 3). Differences in mental well-being were significant only for the fathers' postpartum depression: it was higher for the second type of families. During the pregnancy, the measures of the attachment to the fetus did not differ significantly between types of families. At this assessment wave, the overall attitude towards the child was also positive in both types of families, however, some of differences were revealed. In the first type of families, fathers considered themselves as more effective in the role of a parent, which can be related to low levels of support from their spouses. In families of the second type, fathers tended

to consider their child more unique, exceptional, compared with fathers from the first type of families, which can probably act as compensation for marital problems.

Table 3

Significant differences in psychological characteristics of types of IVF couples during the child's infancy

Measures	Family member	Comparison	U/t	r
Happiness in the relationships	M*	Type 1 > Type 2	304.00	0.22
Warmth towards the partner	M*	Type 1 > Type 2	287.00	0.25
	F**	Type 1 > Type 2	2.99	0.36
Family functioning	M*	Type 1 > Type 2	2.88	0.35
	F**	Type 1 > Type 2	4.13	0.47
Parental self-efficacy	F*	Type 1 > Type 2	2.38	0.29
Perception of infant's qualities	F*	Type 1 < Type 2	2.37	0.30
Depression	F**	Type 1 < Type 2	278.00	0.31

NC families of the first type were also characterized by better marital relations compared to the families of the second type (Table 4). The levels of mothers' and fathers' happiness in the relationship did not differ significantly between the groups. In addition, in the first type of families, both parents had significantly lower levels of postpartum depression, which is similar to the pregnancy period. Families of the first type were characterized by more positive parental attitudes: higher levels of self-efficacy in motherhood and fatherhood, higher warmth and care towards the child, higher paternal perceived influence on the child, less frequent strict discipline performed by the father.

Table 4

Significant differences in psychological characteristics of types of NC couples during the child's infancy

Measures	Family member	Comparison	U/t	r
Warmth towards the partner	M**	Type 1 > Type 2	2.91	0.34
	F**	Type 1 > Type 2	3.00	0.32
Family functioning	M**	Type 1 > Type 2	3.95	0.29
	F**	Type 1 > Type 2	1214.50	0.32
Parental self-efficacy	M**	Type 1 > Type 2	1392.50	0.27
	F*	Type 1 > Type 2	1574.50	0.19
Perceived parental impact	F**	Type 1 > Type 2	1206.00	0.32
Hostile-reactive parental behavior	F*	Type 1 < Type 2	1529.00	0.20
Warmth towards the child	M*	Type 1 > Type 2	1593.00	0.21
	F*	Type 1 > Type 2	1575.00	0.20
Depression	M**	Type 1 < Type 2	1432.00	0.26
	F**	Type 1 < Type 2	1189.50	0.33

Discussion

The results indicate the absence of the significant differences in marital relations associated with the conception type, which is consistent with the data presented by Cairo et al. (2012), Cebert et al. (2019). At the same time, fathers from families with induced pregnancy demonstrated higher warmth, care and support towards their spouse during the pregnancy, compared with the fathers from NC families (Ying et al., 2015). Therefore, marital relations can be identified as a resource that helps women to cope with the stress associated with IVF procedures and the pregnancy period (Anaman-Torgbor et al., 2021). However, the observed effect sizes were low.

In the child's infancy, in families of both groups universal tendencies were revealed, that were characterized by an increase in marital discord, which was previously demonstrated by Gameiro et al. (2011), Cairo et al. (2012). This result suggests that the characteristics of marital relations are largely explained by the feelings caused by the transition to new stage of the family life cycle beginning after the childbirth (Lévesque et al., 2020).

During the pregnancy and the childbirth, most participants who conceived a child through IVF didn't experience any mental health problems, which is not consistent with the results presented in Russian and international studies (McMahon et al., 2013; Kocherova et al., 2016), and may be explained by the differences in the samples and the psychodiagnostic methods. However, an increased level of depression, observed in 3.3 % of fathers, highlights the need for psychological support to be provided for such fathers after the childbirth. It should be noted that the low levels of postpartum depression in mothers observed in the present study may indicate a tendency to suppress negative emotions, which was not investigated due to the limitations of the research.

Parental attitudes in families with induced pregnancy were characterized by the early development of maternal and paternal roles, higher prenatal attachment to the child, compared with the control group. In the child's infancy, the parents showed a high level of warmth, care towards the child. They expressed the awareness of their own importance for the child's development and perceived themselves as the parents who a capable of childcare. The total measure of the attitude towards the child of both parents was significantly higher than in control group. This is consistent with the results indicating high level of attachment to the child in families who conceived a child through IVF, which is developed even before the birth of the child (Chen et al., 2011). At the same time, while this characteristic was previously identified in mothers (Malenova & Kytkova, 2015; Langher et al., 2019), our study confirmed the high significance of the child for fathers as well. Yakupova & Zakharova (2016) revealed the ambivalent nature of maternal attitude to the child: a declared positive attitude towards the child combined with an unconscious rejection of them, which was not tested in the present study. In the child's infancy, the group-specific differences in perception of child's qualities as special, positively different from the qualities of other children, was significant only for fathers: fathers in IVF had significantly higher scores than NC fathers. This result may indicate the risk for having high expectations from the child, which was previously observed in mothers (Solovyova, 2014).

High value of parenthood identified in IVF families was also observed in the typological differences. During the pregnancy, in each group, 2 types of families were identified with different levels of marital and mental well-being, and these differences remained stable during the child's infancy. In the first type of IVF families called "Marital and parental well-being", the spouses successfully coped with the stress associated with infertility and IVF treatment. The high degree of cohesion of the spouses, and satisfaction with marital relations contributed to their mental well-being and stability in stressful circumstances. On the contrary, for families of the second type "Marital discord and a high value of parenthood", the infertility had a destabilizing effect, and could be probably diagnosed in families that were having some marital problems. In such families, problems in marital relations and the emotional isolation of the spouses were combined with their psycho-emotional distress. During the pregnancy both types of families were characterized by a high degree of attachment to the fetus, associated with a long-awaited pregnancy, and the need to go through fertility treatment to achieve conception. It is likely that the similarly high degree of attachment to the fetus in each of these types of families has its own specifics. In families of the second type, it can act as the compensation for marital and mental problems, but this aspect was not studied in our study.

Types of NC families were similar to IVF families in terms of marital relationships and mental well-being. At the same time, the second type of families was called "Difficulties in marital relations and parental attitudes", since levels of the attachment to the fetus and the attitude towards the infant in such families were significantly lower than in the first type of families. This result demonstrates a close relationship between marital relations, mental well-being and attitude towards the child in families with natural conception, while in families with induced pregnancy parental relations are relatively independent.

The present study adds to the scientific data on the high value of parenthood for spouses with reproductive health disorders, and shows its relative independence from other aspects of family functioning for both parents. The results indicate the directions of psychological support for families during the transition to a new stage of the family life cycle.

References

Anaman-Torgbor, J. A., Jonathan, J. W. A., Asare, L., Osarfo, B., Attivor, R., Bonsu, A., Fialor, E. A. E., & Tarkang, E. E. (2021). Experiences of women undergoing assisted reproductive technology in Ghana: A qualitative analysis of their experiences. *PloS One*, *16*(8). https://doi.org/10.1371/journal.pone.0255957

Barnett, B. E. W., Hanna, B., & Parker, G. (1983). Life event scales for obstetric groups. *Journal of Psychosomatic Research*, *27(4)*, 313–320. https://doi.org/10.1016/0022-3999(83)90054-5

Blake, L., Casey, P., Jadva, V., & Golombok, S. (2012). Marital stability and quality in families created by Assisted Reproduction Techniques: A follow-up study. *Reproductive Biomedicine Online*, *25*(7), 678–683. https://doi.org/10.1016/j.rbmo.2012.09.006

Boivin, M., Pérusse, D., Dionne, G., Saysset, V., Zoccolillo, M., Tarabulsy, G. M., Tremblay, N., & Tremblay, R. E. (2005). The genetic-environmental etiology of parents' perceptions and self-assessed behaviours toward their 5-month-old infants in a large twin and singleton sample. *Journal of Child Psychology and Psychiatry*, *46*(6), 612–630. https://doi.org/10.1111/j.1469-7610.2004.00375.x

Brugha, T. S., & Conroy, R. (1985). Categories of depression: Reported life events in a controlled design. *The British Journal of Psychiatry*, *147*(6), 641–646. https://doi.org/10.1192/bjp.147.6.641

Cairo, S., Darwiche, J., Tissot, H., Favez, N., Germond, M., Guex, P., de Roten, Y., Frascarolo, F., & Despland, J.-N. (2012). Family interactions in IVF families: Change over the transition to parenthood. *Journal of Reproductive and Infant Psychology*, *30*(1), 5–20. https://doi.org/10.1080/02646838.2012.669830

Caparros-Gonzalez, R. A., Romero-Gonzalez, B., Quesada-Soto, J. M., Gonzalez-Perez, R., Marinas-Lirola, J. C., & Peralta-Ramírez, M. I. (2019). Maternal hair cortisol levels affect neonatal development among women conceiving with assisted reproductive technology. *Journal of Reproductive and Infant Psychology*, *37*(5), 480–498. https://doi.org/10.1080/02646838.2019.1578949

Cebert, M., Silva, S., & Stevenson, E. L. (2019). Are there differences in marital-role quality between women and their male partners who conceived via IVF and those who did not? *The Journal of Best Practices in Health Professions Diversity*, *11*(2), 135–149.

Chen, C.-J., Chen, Y.-C., Sung, H.-C., Kuo, P.-C., & Wang, C.-H. (2011). Perinatal attachment in naturally pregnant and infertility-treated pregnant women in Taiwan. *Journal of Advanced Nursing*, *67*(10), 2200–2208. https://doi.org/10.1111/j.1365-2648.2011.05665.x

Cranley, M. S. (1981). Development of a tool for the measurement of maternal attachment during pregnancy. *Nursing Research*, *30*(5), 281–284. https://doi.org/10.1097/00006199-198109000-00008

Darwiche, J., Favez, N., Simonelli, A., Antonietti, J.-P., & Frascarolo, F. (2015). Prenatal coparenting alliance and marital satisfaction when pregnancy occurs after Assisted Reproductive Technologies or spontaneously. *Family Relations*, *64*(4), 534–546. https://doi.org/10.1111/fare.12131

Dueva, A. A. (2014). Interaction with the mother in children born as a result of in vitro fertilization (IVF): attachment and parenting style features. *Psychological Science and Education psyedu.ru*, *6*(2), 293–305. https://doi.org/10.17759/psyedu.2014060225 (in Russ.).

Dyachkova, E. S. (2013). Psychological peculiarities of families with impaired reproductive health. *Bulletin of Tambov State University*. *Series: Humanities*, 9, 199–207. (in Russ.).

Epstein, N. B., Baldwin, L. M., & Bishop, D. S. (1983). The McMaster family assessment device. *Journal of Marital and Family Therapy*, *9*(2), 171–180. https://doi.org/10.1111/j.1752-0606.1983.tb01497.x

Fata, S., Tokat, M. A., & Uğur, G. T. (2021). Does conception spontaneously or with ART affect postpartum parenting behaviors? *Psychology, Health & Medicine*, *26*(6), 755–763. https://doi.org/10.1080/13548506.2020.1799044

Gameiro, S., Nazaré, B., Fonseca, A., Moura-Ramos, M., & Canavarro, M. C. (2011). Changes in marital congruence and quality of life across the transition to parenthood in couples who conceived spontaneously or with assisted reproductive technologies. *Fertility and Sterility*, *96*(6), 1457–1462. https://doi.org/10.1016/j.fertnstert.2011.09.003

Gardanova, Zh. R., Khritinin, D. F., Voronina, T. I., & Lapina, V. S. (2021b). The features of intrafamilial relationships in infertile marriage in the in-vitro fertilization (IVF) program. *Bulletin of Neurology, Psychiatry and Neurosurgery*, 12, 900–909. https://doi.org/10.33920/med-01-2112-01 (in Russ.).

Gardanova, Zh. R., Petrov, N. I., & Khritinin, D. F. (2021a). The features of emotional response in men in a sterile marriage. *Bulletin of Neurology, Psychiatry and Neurosurgery*, 5, 33–36. https://doi.org/10.33920/med-01-2105-02 (in Russ.).

Hadley, R., & Hanley, T. (2011). Involuntarily childless men and the desire for fatherhood. *Journal of Reproductive and Infant Psychology*, *29*(1), 56–68. https://doi.org/10.1080/02646838.2010.544294

Hanna, E., & Gough, B. (2020). The social construction of male infertility: A qualitative questionnaire study of men with a male factor infertility diagnosis. *Sociology of Health & Illness*, *42*(3), 465–480. https://doi.org/10.1111/1467-9566.13038

Jongbloed-Pereboom, M., Middelburg, K. J., Heineman, M. J., Bos, A. F., Haadsma, M. L., & Hadders-Algra, M. (2012). The impact of IVF/ICSI on parental well-being and anxiety 1 year after childbirth. *Human Reproduction*, *27*(8), 2389–2395. https://doi.org/10.1093/humrep/des163

Kocherova, O. Ju., Pykhtina, L. A., Gadzhimuradova, N. D., Filkina, O. M., & Malyshkina, A. I. (2016). Psychological characteristics of mothers of children conceived with use of in vitro fertilization. *Clinical Psychology and Special Education*, *5*(3), 69–77. https://doi.org/10.17759/cpse.2016050305 (in Russ.).

Langher, V., Fedele, F., Caputo, A., Marchini, F., & Aragona, C. (2019). Extreme desire for motherhood: Analysis of narratives from women undergoing Assisted Reproductive Technology (ART). *Europe's Journal of Psychology*, *15*(2), 292–311. https://doi.org/10.5964/ejop.v15i2.1736

Lévesque, S., Bisson, V., Charton, L., & Fernet, M. (2020). Parenting and relational well-being during the transition to parenthood: Challenges for first-time parents. *Journal of Child and Family Studies*, *29*, 1938–1956. https://doi.org/10.1007/s10826-020-01727-z

Locke, H. J., & Wallace, K. M. (1959). Short marital-adjustment and prediction tests: Their reliability and validity. *Marriage & Family Living*, *21*(3), 251–255. https://doi.org/10.2307/348022

Malenova, A. Yu., & Kytkova, I. G. (2015). The relations to pregnancy, the child, motherhood of women in IVF situation. *Pediatrician*, *6*(4), 97–104. https://doi.org/10.17816/PED6497-104 (in Russ.).

McMahon, C. A., Boivin, J., Gibson, F. L., Hammarberg, K., Wynter, K., Saunders, D., & Fisher, J. (2013). Pregnancy-specific anxiety, ART conception and infant temperament at 4 months post-partum. *Human Reproduction*, *28*(4), 997–1005. https://doi.org/10.1093/humrep/det029

Melby, J. N., & Conger, R. D. (2000). The Iowa Family Interaction Rating Scales: Instrument summary. In P. K. Kerig, K. M. Lindahl (Eds.), *Family observational coding systems: Resources for systemic research*. Psychology Press. https://doi.org/10.4324/9781410605610-8

Miller, N., Herzberger, E. H., Pasternak, Y., Klement, A. H., Shavit, T., Yaniv, R. T., Ghetler, Y., Neumark, E., Eisenberg, M. M., Berkovitz, A., Shulman, A., & Wiser, A. (2019). Does stress affect IVF outcomes? A prospective study of physiological and psychological stress in women undergoing IVF. *Reproductive Biomedicine Online*, *39*(1), 93–101. https://doi.org/10.1016/j.rbmo.2019.01.012

Mohammadi, N., Shamshiri, M., Mohammadpour, A., Vehviläinen-Julkunen, K., Abbasi, M., & Sadeghi, T. (2015). Super-mothers: The meaning of mothering after assisted reproductive technology. *Journal of Reproductive and Infant Psychology*, *33*(1), 42–53. https://doi.org/10.1080/02646838.2014.970152

Naku, E. A., Bokhan, T. G., Ul'yanich, A. L., Shabalovskaya, M. V., Tosto, M. G., Terekhina, O. V., & Kovas, Yu. V. (2016). Psychological characteristics of women undergoing an IVF treatment. *Gynecology, Obstetrics and Perinatology*, *15*(6), 23–30. https://doi.org/10.20953/1726-1678-2016-6-23-30 (in Russ.).

Paterlini, M., Andrei, F., Neri, E., Trombini, E., Santi, S., Villani, M. T., Aguzzoli, L., & Agostini, F. (2021). Maternal and paternal representations in Assisted Reproductive Technology and spontaneous conceiving parents: A longitudinal study. *Frontiers in Psychology*, 12. https://doi.org/10.3389/fpsyg.2021.635630

Poulin, C., Hand, D., & Boudreau, B. (2005). Validity of a 12-item version of the CES-D used in the National Longitudinal Study of Children and Youth. *Chronic Diseases in Canada*, *26*(2–3), 65–72.

Simionescu, G., Doroftei, B., Maftei, R., Obreja, B.-E., Anton, E., Grab, D., Ilea, C., & Anton, C. (2021). The complex relationship between infertility and psychological distress (Review). *Experimental and Therapeutic Medicine*, *21*(4). https://doi.org/10.3892/etm.2021.9737

Snaith, R. P., Constantopoulos, A. A., Jardine, M. Y., & McGuffin, P. (1978). A clinical scale for the self-assessment of irritability. *The British Journal of Psychiatry*, *132*(2), 164–171. https://doi.org/10.1192/bjp.132.2.164

Solovyova, E. V. (2014). On maternal attitude toward young children conceived through in vitro fertilization. *Psychological Science and Education psyedu.ru, 6*(4), 147–156. https://doi.org/10.17759/psyedu.2014060413 (in Russ.).

Yakupova, V. A., & Zakharova, Ye. I. (2016). Features of inner position of mother in IVF women. *Cultural-Historical Psychology*, *12*(1), 46–55. https://doi.org/10.17759/chp.2016120105 (in Russ.).

Ying, L.-Y., Wu, L. H., & Loke, A. Y. (2015). The experience of Chinese couples undergoing in Vitro Fertilization Treatment: Perception of the treatment process and partner support. *PloS One*, *10*(10). https://doi.org/10.1371/journal.pone.0139691

Yusuf, L. (2016). Depression, anxiety and stress among female patients of infertility: A case

control study. *Pakistan Journal of Medical Sciences*, *32*(6), 1340–1343. https://doi.org/10.12669/pjms.326.10828

Zybailo, V. S., Filimonenkova, V. Yu., & Kopytov, A. V. (2015). Study of individual and psychological characteristics of infertile women. *Medical Journal*, 1, 82–87. (in Russ.).

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Conflict of Interest Information

The authors have no conflicts of interest to declare.