

Attachment forerunners, dyadic sensitivity and development of the child in families with a preterm born baby

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Abstract

Objective: The aim of this study is to explore attachment forerunners and dyadic sensitivity in the family with preterm born child.

Methods: 89 families, 35 with preterm born children (≤ 1500 gr.) and 54 with term born babies (≥ 2500 gr.) were studied from 3 months to 1 year corrected age (267 total subjects). Mother-child and father-child couples were subjected to *CARE-Index* and both parents to DAS, CES-D and STAI Y-2. The child's psychomotor development was assessed by *Bayley Scales*.

Results: The mothers of preterm children presented high risk interactive behaviors at *CARE-Index* (low scores at Dyadic Sensitivity Scale, $p = .000$), high anxiety ($p = .003$) and depression ($p = .03$). Preterm fathers presented low scores at Dyadic Sensitivity Scale ($p = .000$) and high anxiety ($p = .024$). In interaction, attachment forerunners suggest an insecure attachment in preterm mothers ($p = .001$) and fathers ($p = .000$) and in preterm children in the interaction with the mother ($p = .028$). These risk factors were correlated, in both parents, with low performance of the child at *Bayley Scales* ($p = .04$). Fathers of preterm children presented also a negative perception of the child and an unsatisfied perception of the hospital care.

Conclusions: The results show in the preterm family that 40% of mothers and 75% of fathers are in high risk area suggested by *CARE-Index*. In these cases, insecure attachment forerunners, low dyadic sensitivity and psychological difficulties (couple conflicts, anxiety, depression) seem to influence the psychomotor development of the preterm child.

In the family with a preterm birth child, the couple interaction and the relationship between parents and children are complex. Studies in this field have investigated in detail the influence of preterm birth on the psychological and somatic development of the baby, on the emotional state of the mother and on her complex relation with the child. Currently, the most recent research is focusing on how preterm birth involves the entire family, and therefore psychological assessment has shifted to study of the mother-father-child triad (Tracey 2000; Jackson et al. 2003).

Empirical research has evidenced how in the perinatal period the mother's and father's emotional states are significantly correlated. In particular, fathers whose companions have undergone affective post partum disorders show greater levels of anxiety, depressive symptoms, irritability, and tendency to somatic complaints and worry about their own health and paternal role up to the fifth month of pregnancy (Baldoni, Baldaro, Benassi 2009). Moreover, in the perinatal period, fathers themselves may also suffer from affective disorders similar to post partum depression with a frequency ranging in the world from 2% to 31.3%, with a mean of 10.4 % in 2010 (Paulson, Bazemore, 2010; Baldoni, Ceccarelli, 2010). The symptoms of *Paternal Perinatal Depression* (PPD) differ from those of *Maternal Perinatal Depression* (MPD), the symptoms are less severe, the disorders are less definite and range from neurotic reactions of restlessness and sadness to melancholy, through states of impotence, desperation, discomfort and somatic complains. Empirical research has found a significant correlation between PPD and MPD (Soliday et al., 1999; Matthey et al., 2000; Buist et al. 2002).

The traumatic experience of preterm birth, the anxiety for illness and death, and the early and prolonged separation from the baby are psychologically stressful and dangerous events for the family. In these situations the family attachment system will be activated, specially in the parents who will react on the basis of their Internal Working Models (IWM). Therefore, they will express adaptive and defensive reactions that could influence the development of infant attachment.

Research on families with preterm children evidenced how, in the first years, the style of parental attachment seems especially important in the subgroup of newborns at high risk: a sensitive mother with secure attachment, able to receive and respond to the child's needs, seems to have a positive influence on the development of these newborns. Likewise, parents who are little responsive and not flexible seem to have negative influence on these preterms at high risk whose linguistic and cognitive capacities, in the first year of life, are lesser than those of term born babies (Minde 2000; Coppola, Cassiba 2004).

Research

The aim of the research unit is to study the development of attachment, the psychological difficulties, the parental couple adjustment quality, the role of father-mother-child relationship and the psychomotor development of the child in the family with preterm birth child from 3 to 30 months corrected age.

The main hypotheses of the research are :

1) preterm birth represents for the family a traumatic and stressful event that involves the whole family and activates the family attachment system. During perinatal period the emotive states of mothers and fathers are connected. In preterm birth, in particular, the parents will display defensive and adaptive behaviours, therefore their attachment styles and psychological characteristics (in terms of dyadic sensitivity and levels of anxiety, depression and stress perception) will influence the quality of the parental couple and mother-child-father relations and the attachment and psychomotor development of the child.

2) In this critical situation, the psychological characteristics of the father are important for the protection of the family and the development of a valid attachment pattern in the child. The father would carry on a secure base function, protecting his partner from too high levels of affective suffering. Fathers with avoiding attachment patterns or preoccupied attachment patterns, and those with psychological difficulties (unresolved loss traumas, anxiety, depression) or behavioural problems, are thought to influence the development of their preterm child.

In particular our research unit intend to study:

1.Attachment patterns and dyadic sensitivity of parents in the interaction with preterm child;
2. The couple adjustment and the expression in the parents of eventual psychological suffering (anxiety, depression, behavioural problems) and high perceived stress levels.

3.The psychological characteristics of preterm child's father (attachment style, dyadic sensitivity, anxiety, depression, stress perception).

4. The connection of these aspects with the development of child's attachment (assessing attachment forerunners at 3 months, and attachment pattern at 1 year of corrected age) and the psychomotor development of the preterm baby.

Finally, a secondary aim of the study is to confront different models of attachment assessment (DMM, Main and Goldwyn AAI, self-reports questionnaires like ASQ, RQ and PBI) particularly regarding their validity and utility in clinical application (this is named the Bologna Attachment Assessment Project).

Experimental design

We are studying an experimental group consisting of 89 families. 35 families with preterm born children (birth weight \leq 1500 gr, gestational age 24-32) and a control group of 54 families with term-born children (birth weight $>$ 2500 gr, gestational age $>$ 40) for 267 total subjects. Families, once informed on the aim and method of the study, were short-listed exclusively on the basis of their willingness to participate in the research, excluding families whose children present ascertained neurological damage. Listings were made in collaboration with the Neonatal Intensive Care Units of AUSL Bologna, Ospedale S. Orsola-Malpighi (Direttore: Prof. Giacomo Faldella), AUSL Rimini, Ospedale Infermi, Rimini (Director: Dr. Nicola Romeo) and AUSL Brescia, Ospedale (Director: Dr. Gaetano Chirico). The research benefits from the scientific consultation by Prof. Patricia M. Crittenden, Head of Family Relations Institute, Miami, Florida, USA, and President of International Association for the Study of Attachment (IASA).

The aim of the research unit is to assess the mother-father-preterm child triad from the first to the second year of corrected age. The study is based on a longitudinal survey with data collection in four steps (3, 6, 12 and 30 months corrected age of the baby), corresponding to particularly important phases for the child's psychomotor development and internal representations of attachment (see Tab. 1).

The research plans on providing the following assessment tools:

To Mother-Child and Father-Child couples:

- *Child-Adult Relationship Experimental Index* (CARE-Index) (Crittenden, 1979-2004) for assessment of the attachment forerunners and the parental dyadic sensitivity.

To both parents:

- *Center for Epidemiologic Studies Depression Scale* (CES-D) (Radloff, 1977) for depressive symptoms assessment;
- *State Trait Anxiety Inventory* Form Y2 (STAI-Y2) (Spielberger et al., 1983) for the trait anxiety assessment;
- *Dyadic Adjustment Scale* (DAS) (Spanier, 1976) for quality of couple adjustment assessment;

To the child:

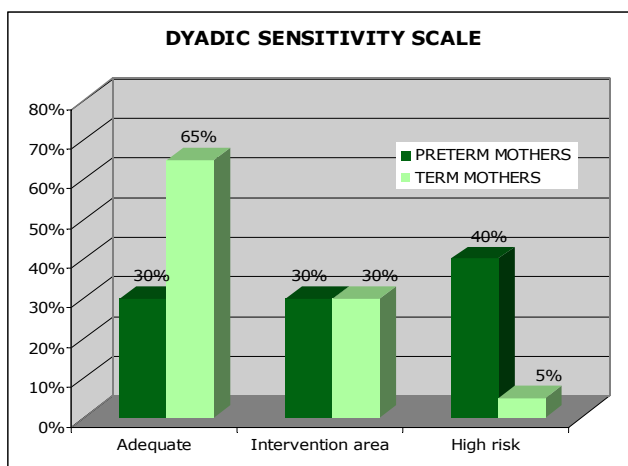
- *Bayley Scales of Infant and Toddler Development* (BSID III) (Bayley, 2006) for child's psychomotor and linguistic development assessment.

For statistical assessment, subjects were divided in subgroups on the basis of the quality of the father's attachment and dyadic sensitivity (attachment forerunners and dyadic sensitivity at CARE-Index, attachment pattern at AAI).

Every research step needs from 30 to 120 minutes of total administration time, to be divided in different sessions. The attachment assessment was conducted following the Dynamic-Maturational Model (DMM) criteria (Crittenden 2000, 2008). The assessment instruments were administered and codified in blind conditions by expert and reliable operators trained in specific courses. Statistical elaboration of data was carried out using parametric (Univariate ANOVA, Bonferroni Post Hoc test) and non-parametric methods (Kruskal-Wallis test).

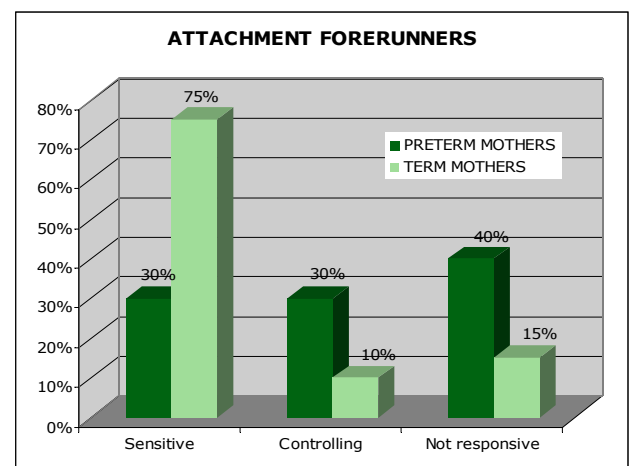
Results

At present, preterm couples and term families were studied from 3 to 12 months corrected age. Data analysis evidenced in mothers of preterm children high risk interactive behaviors at CARE-index (low scores at Dyadic Sensitivity Scale, $p = .000$) (see Fig. 1), high levels of anxiety traits at STAI-Y2 ($p = .003$), of depression ($p = .03$) at CES-D and a lower couple adjustment at DAS ($p = .008$), with particular regard to a lower level of consensus in the relation with the partner (Dyadic Consensus scale, $p = .001$).



($p = .000$)

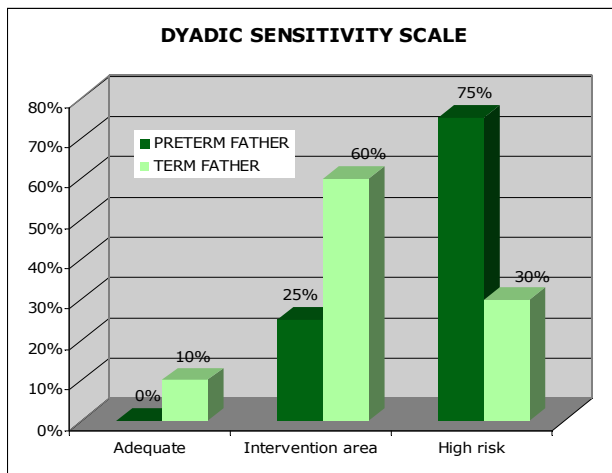
40% of preterm mothers are at risk vs 5% of controls



($p = .001$)

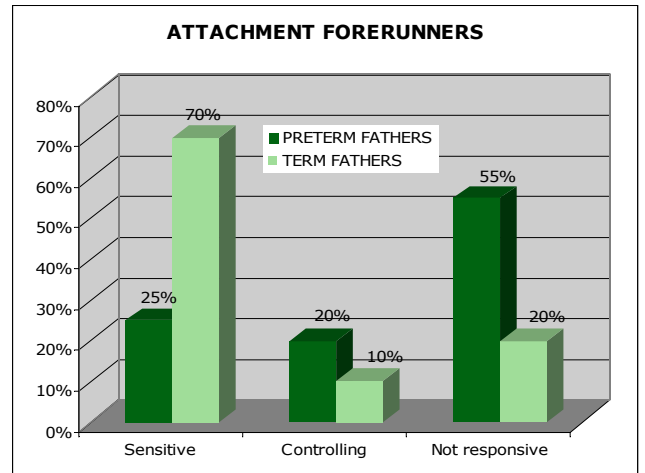
Fig. 1-2 - Mother-child CARE-Index

Fathers of preterm children also manifested low scores at Dyadic Sensitivity scale of CARE-index ($p = .000$) (see Fig. 3) and high levels of anxiety at STAI-Y2 ($p = .024$). In interaction with the child, assessed with CARE-Index, attachment forerunners show more frequently an insecure attachment in mothers ($p = .001$) (see Fig. 2) and in fathers of preterm children ($p = .000$) (see Fig. 4), and in preterm born children in the interaction with the mother only ($p = .028$) (see Figg. 5-6).



($p = .000$)

75% of preterm fathers are at risk vs 30% of controls

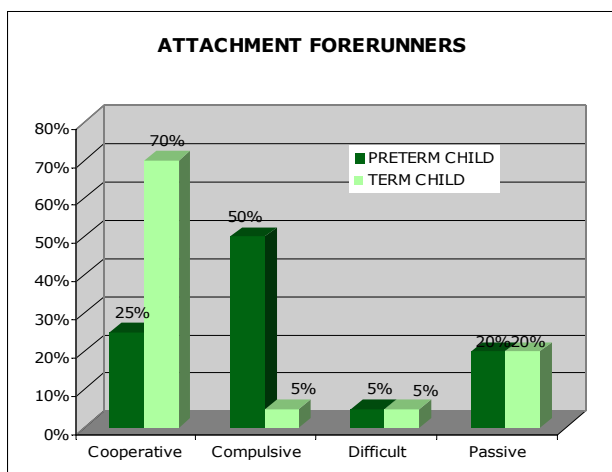


($p = .000$)

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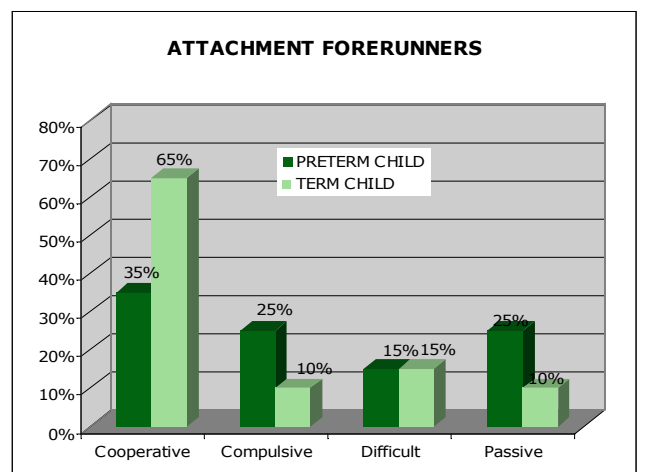
Figg. 3-4 – Father-child CARE-Index

MOTHER-CHILD INTERACTION



($p = .028$)

FATHER-CHILD INTERACTION



(N.S)

Figg. 5-6 – Child attachment forerunners at CARE-Index

6

Moreover, in mothers of preterm children, risk factors were pointed out as difficulties in relation with the origin family and a high anxiety for the death of the children.

Risk factors in fathers of preterm children are even more important than those of mothers. In particular they have frequently: a negative perception of the child, more difficulties in interaction and an intense uncomfortable feeling during the first contact with it, significant stressful events in the last year (work and economic difficulties, health problems, losses) ($p \leq 0.02$) and a less satisfied perception of the hospital care ($p \leq 0.00$).

Dividing the sample on father's attachment forerunners basis and on their dyadic sensitivity at CARE-Index, univariad ANOVA data evidenced that insecure attachment forerunners, low dyadic sensitivity and high levels of depressive and anxious symptoms were correlated, in both parents, with lower scores of the performance of the child in almost all Bayley scale indexes ($p = .04$). In particular, children with fathers with insecure attachment forerunners reported significantly lower scores at all Bayley scales. Post Hoc tests (Bonferroni) confirmed significant differences between fathers with low and high dyadic sensitivity, fathers with secure and insecure forerunners of attachment, but not between individual insecure patterns (controlling, not responsive).

Discussion

These research data show the dyadic sensitivity, and the interactive mother-child and father-child behaviors at three months corrected age are significantly different in the families of preterm born children towards the control group. 40% of mother-preterm child interactions (against 5% of controls) and 75% of father-preterm child interaction (against 30% of controls) are in the "high risk area" suggested by CARE index, an area that often requires psychological and pharmacological treatment. Attachment forerunners in preterm children's parents, moreover, are significantly different from those of term children's families.

Psychosocial risk factors evidenced in the preterm child's parents (lower couple adjustment, high levels of anxiety and depressive symptoms) resulted significantly correlated to a lower psychomotor development of the preterm child assessed at six months of age by Bayley scales.

In our sample, mothers of preterm children are characterized by maternal behaviors apparently affective, but really controlling, intrusive or "not responsive", i.e. not sensitive towards the child's signals, particularly the negative ones. Only few of these mothers showed a sensitive pattern.

The significance of this maternal attitude, for the development of the child, is still unclear.

Regarding the possible effects of an excessive maternal stimulation, studies on premature children show different and frequently contradictory results and hypotheses. Some authors judge negatively an excessive maternal intrusion, considering it implies an overload of stimulations for the baby. Other authors consider it a type of compensation developed by the mother to fill the possible developmental difficulties of the premature baby.

An interesting datum evidenced by this study is the high number of fathers of preterm children that show difficulties in interaction with the child (low dyadic sensitivity and insecure attachment forerunners at CARE-index) and other psychological risks factors (negative perception of the child, intense uncomfortable feeling during the first contact with it, depressive symptoms), even more frequent and intense than the mothers'.

Moreover, mothers of preterm children showed a lesser couple adjustment, in particular lower levels of dyadic consensus with the partner (at DAS). These factors may affect negatively the mother-child-father relationship. Research evidenced a positive correlation between satisfaction in couple relation and quality of mother-child relation. Therefore, a valid help supplied by the father to the companion fosters a better mother-child relation.

Following attachment theory, an important male function, in perinatal period, seems to supply a secure base for his companion, helping her to overcome the difficulties, keeping the suffering at endurance levels and fostering the conditions by which the special relation between the mother and the baby can develop in an adequate way. In fact, preoccupied, too anxious or depressed fathers, or those with behavioural problems (pathological aggressiveness, alcoholism, addiction disorders) can be a handicap for the emotional equilibrium of their companion and for the good development of the relationship between mother and child (Das-Eiden, Leonard 1996; van IJzendoorn, De Wolff 1997; Luca, Bydlowsky 2001; Baldoni, Baldaro, Benassi 2009; Baldoni, Ceccarelli, 2010; Baldoni 2010a). A lack of this protective function can foster an affective disorder in the mother and negatively influence the attachment and psychomotor development of the child.

Lower dyadic sensitivity and insecure attachment forerunners, in fathers, (independently from the term or preterm birth of their child) resulted significantly correlated to a lower psychomotor development at all Bayley scales assessed at six months.

Fathers of preterm children show also more significant stressful events in the last year that can remove them from couple and parental tasks, focusing them on external problems, rather than dedicating themselves to the family (Parke, 1996).

The first data of this research underline the necessity of longitudinal studies on wide samples to assess internal working models (i.e. attachment styles) of preterm born children's parents, their sensitivity in the relation with the child and the link between parenting stress and

quality of family attachment. These researches could check if parental behavior in these families is adaptive and transitory, or a negative trend that will influence the development of the child in the future.

Conclusions

This study confirms the research data concerning the influence of attachment style and relational capacities of both parents on psychomotor development of preterm born children and the attachment relationship between this and the mother. In particular, in fathers it shows a correlation between insecure attachment and low dyadic sensitivity with a low adjustment by the couple, the development of an infant's insecure attachment and a manifestation of psychomotor difficulties in the preterm born child. The research will provide useful data for the development of preventive and treatment interventions, increasingly targeted and sustained over time, considering also the father figure and taking into account the specific developmental needs, the psychological difficulties of the preterm infant and its family, also considering eventual difficulties of the siblings (psychological help from the physician and nurses in the ward, assistance from a psychologist, psychoeducational groups, possible individual, couple or family counselling or therapy) (Baldoni et al. 2009; Cena, Imbasciati, Baldoni, 2010; Baldoni 2010b). It will be also possible to organize special training seminars and consulting meetings for operators of the Departments of Obstetrics and Gynaecology and Neonatal Intensive Care Unit to ensure a long-term monitoring of psychological and physical health of the premature born child and an appropriate psychological help for its family.

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References

1. Baldoni F. (2010a) *Attachment, danger and role of the father in family life span*. Transilvanian Journal of Psychology (Erdélyi Pszichológiai Szemle, EPSZ), 4, pp. 375-402.
2. Baldoni, F. (2010b): "Attachment relationships and psychosomatic development of the child in families with a preterm baby. A study in DMM perspective." *2nd Biennial Conference of the International Association for the Study of Attachment (IASA)* (St. John's College, Cambridge, UK, August 29-31 2010), pp. 1-15.
3. Baldoni, F., Baldaro, B., Benassi, M. (2009): "Affective disorders and illness behaviour in perinatal period: correlations between fathers and mothers", *Child Development & Disabilities, XXXVI, Saggi*, Vol. 3., pp. 25-44.
4. Baldoni, F., Ceccarelli, L. (2010) "La depressione perinatale paterna. Una rassegna della ricerca clinica ed empirica", *Infanzia e Adolescenza*, 9 (2), pp. 79-92.
5. Baldoni, F., Facondini, E. , Minghetti, M. , Romeo, N. , Landini, A. , Crittenden, P.M. (2009): "Family attachment and psychosomatic development in preterm-born children", *Panminerva Medica*, 51 (suppl. 1 to N.3), p. 7.

6. Bayley, N. (2006): *Bayley Scales of Infant and Toddler Development - Terza edizione*, The Psychological Corporation, San Antonio, Texas.
7. Bowlby, J. (1988): *Una base sicura*. Raffaello Cortina, Milano, 1989.
8. Buist, A., Morse, C.A., Durkin, S. (2003): "Men's Adjustment to Fatherhood: Implications for Obstetric Health Care". *JOGNN*, 32: 172-180.
9. Cena L., Imbasciati A., Baldoni F. (Eds.) (2010): *La relazione genitore-bambino. Dalla psicoanalisi infantile alle nuove prospettive evoluzionistiche dell'attaccamento*. Springer Verlag, Milano, 2010.
10. Coppola, G., Cassibba, R. (2004): *La prematurità: fattori di protezione e di rischio per la relazione madre-bambino*, Carocci Editore, Roma.
11. Crittenden, P.M. (1979-2004): *CARE-Index: Coding Manual*, manoscritto non pubblicato, Miami, FL.
12. Crittenden, P.M. (2000): "A Dynamic-Maturational Approach to continuity and change in pattern of attachment". In P.M. Crittenden, A.H. Claussen (ed.), *The Organization of attachment relationships. Maturation, culture and context*. Cambridge, Cambridge University Press, pp. 343-357.
13. Crittenden, P.M. (2008): *Il Modello Dinamico-Maturativo dell'attaccamento*. Milano, Libreria Cortina.
14. Das-Eiden, R., Leonard, K.E. (1996): "Paternal alcohol use and the mother infant relationship", *Development and Psychopathology*, 8, pp.307-323.
15. Jackson, K., Ternstedt, B.M, Schollin, J., (2003): "From alienation to familiarity experiences of mothers and fathers of preterm infants", *Journal of Advanced Nursing*, 43 (2), pp. 120-129.
16. Luca, D., Bydlowski, M. (2001): "Dépression Paternelle et périnatalité", *Le CarnetPsy*, 67, pp. 28-33.
17. Matthey, S., Barnett, B., Ungerer, J., Waters, B. (2000): "Paternal and maternal depressed mood during the transition to parenthood", *Journal of Affective Disorders*, 60(2), pp. 75-85.
18. Minde, K. (2000): "Prematurity and serious medical conditions in infancy: implications for development, behaviour and intervention", in Jr, Zeanah, H., Charles (Eds.) *Handbook of infant mental health*, Guilford Press, New York, XVII, pp. 176-194.
19. Parke, R.D. (1996). *Fatherhood*. Harvard University Press, Cambridge.
20. Paulson, J.F., Bazemore, S.D. (2010): "Prenatal and postpartum depression in fathers and its association with maternal depression". *JAMA*, 303(19), 1961-1969.
21. Radloff, L.S. (1977): "The CES-D Scale", *Applied Psychological Measurements*, 1, pp. 385-401.
22. Soliday, E., McCluskey-Fawcett, K., O'Brien, M. (1999): "Postpartum affect and depressive symptoms in mothers and fathers". *American Journal of Orthopsychiatry*, 69(1), pp. 30-8.
23. Spanier, G.B. (1976): "Measuring dyadic adjustment; New scales for assessing the quality of marriage and similar dyads". *Journal of Marriage and the Family*, 38, pp. 15-28.
24. Spielberger, C.D., Gorsuch, R.L., Luschene, R., Vagg, P.R., Jacobs, G.A. (1983): *Manual for the State-Trait Anxiety Inventory (Form Y)*, Consulting Psychologist Press, Palo Alto.
25. Tracey, N. (2000): *Parents of premaure infants. Their emotional world*. Whurr Publishers, London.
26. van Ijzendoorn, M.H., De Wolff, M.S. (1997): "In search of the absent father – Meta-analyses of infant-father attachment", *Child Development*, 68 (4), pp. 604-609.

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