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Mood Disorders and Mother-Infant Relationship – The Supportive Role of a Midwife

Ana Polona Mivšek and Tita Stanek Zidarič

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1. Introduction

It was Freud in 1940 [1] who referred to the mother's bond with a child as "unique, without parallel", and who has asserted that the mother is "established unalterably for a whole lifetime as our first and strongest love object... the prototype of all later love relations". It is the trust created in the mother-baby bond that sets the stage for the adult's later relationships. At core, this trust comes from the most basic level of relating, including with touch that can be felt both literally and symbolically. Successful relating comes from the mother's ability to connect with her baby from one mind to another as associated to empathic identification with baby's state of mind; the Winnicott's primarily preoccupation. It is also important that mother connects with her infant from one body to another, defining boundary between internal and external space, forever impacting psychological development. These early sensorial encounters then become the basis for our experiences of self and identity.

The psychological well-being of a mother during the pregnancy and after the birth can have a profound effect on the care she provides for the baby. The baby needs eye contact, affectionate handling and sound stimulation for successful development. Postnatal depression (PND) can impair mother's ability to provide a baby with these stimulations [2]. Parental psychological influences and adverse lifestyle choices have consistently demonstrated an impact upon the outcome for newborn infants and have impact on them also in their adulthood. One of such situations is also maternal depression. Therefore the aim of intervention strategies for this condition is to break this cycle [3].

Improving maternal depression does not, in itself, necessarily improve mother-infant interaction [4]. Different interventions that enhance creation of mother-infant relationship can be therefore considered as crucial for the benefits of parent-infant dyad when mother is de-

pressed. Already in 1977 Field [5] has recommended teaching mothers both - about infants' cues and also about the baby massage.

Based upon these recommendations, the following chapter aims to present arguments of benefits to improve PND for two interventions (Newborn Behavioural Observation – NBO and infant massage).

2. Background

Postnatal period can be very demanding for a new mother; acceptance of new role, changes of a lifestyle and continuous care for the baby can be tiring. In the postnatal period family with a baby receives postnatal care at home. Ideally by the midwife who cared for the woman during the pregnancy and birth. Beside the check-up for the woman's physical changes and care of the newborn, midwives should offer support and advice on adaptation to parenthood and be aware of signs of poor emotional well-being [6]. Postpartum mood disorders represent the most frequent form of maternal morbidity following delivery [7]. Midwife can include certain practices in the routine postnatal care that can help women raise her self-esteem in transition to motherhood and consequently alleviate depressive mood.

2.1. Postnatal period and postnatal depression

There is no specific definition of PND [8]; the debate, whether this is a general depression, incidentally occurring after the birth of a child or whether it is an entity on its own, still lasts. PND is categorized as major depressive disorder. Symptoms are similar to a general major depressive episode [9]. Three of the symptoms from the seven listed in the ICD 10 classification or four from the eight symptoms listed by DSM IV [10] must be present in order for woman to be diagnosed with PND. However symptoms may be masked by the common changes of postnatal period (fatigue, weight loss, tiredness ect.) [11].

As the definition of PND, also the duration and the onset of PND are not clearly defined. The crucial time for onset is around third [9] to sixth week postpartum [8,11], but some women can develop PND from pre-existing depressive states prenatally [3,12]. If untreated, PND can last up to the end of first postpartum year [11] or even longer.

Longitudinal and epidemiological studies have estimated different prevalence rates of PND, ranging from 3% to more than 28% of women [7]. Beck and Gable [13] report 12% prevalence of severe depression and 19% of minor.

It is still not known exactly what triggers the outbreak of mental disturbances in the postnatal period [14]. The literature regarding the aetiology of PND is inconclusive and many researchers support the theory of a synergistic effect of several factors [15,16.] The quantity of the risk factors identified in the literature calls into question their usefulness at predicting PND [17]. According to experts [18] the presentation of PND varies individually. Since women are individuals, a healthcare professional would be required to have in-depth

knowledge about their personality, life situation and expectations regarding the motherhood in order to successfully interpret their behaviour postnatally.

Women with PND rarely seek help on their own (sometimes because they are not aware of the reason for their bad mood or might be afraid of stigma associated with mental illnesses), it is estimated that approximately 50% of cases of PND go undetected by health workers [13]. It is therefore recommended that screening should be performed as a part of routine postnatal care [19].

In depression with mild to moderate symptoms, non-pharmacological treatment is proposed [20]. Because many women decline pharmacological treatments, these interventions are often the first line treatment [21]. Despite the fact that some experts believe that these therapies are unhelpful in the long term, they admit that there is an improvement in maternal mood right after their application [4,22]. Antidepressants may be considered for use in women with mild, moderate or severe PND, only when they are unresponsive or reluctant to participate in non-drug management programmes [23], if the woman is at risk of suicide or infanticide, or has severe depression that does not respond to non-pharmacological treatment [20]. A lot of new methods of complementary treatment are currently being evaluated in order to help women with PND, for example acupuncture [24], massage therapy [25], bright light therapy [26,27], kangaroo (skin to skin) therapy [28] or regular physical activity [29,30] etc.

There is an on-going debate whether PND is an illness or normal and understandable response to difficulties of motherhood [31]. However it was never denied that women need help to cope with these feelings. It is a general tendency that woman should be treated at home in a known environment with the support of partner and other family members. PND can affect all family members, therefore all interventions should be family centred [32].

2.1.1. Impact of maternal depression on infant

It has been suggested that the child may be a factor in the development of PND, particularly in the case of multiple pregnancies, when the child is immature or has special needs [33]. Others have suggested that demanding childcare on its own could be a trigger for PND [34]. McIntosh [35] interviewed mothers to identify the main cause of PND. Women perceived motherhood as such to be the strongest risk factor, because it entails cyclic, demanding and responsible work that isolates them and robs them of their freedom. Additional burdens were lack of support and lack of time for themselves. Depressed mothers report significantly higher perceived stress, related to the child care and lower self-esteem in connection to motherhood abilities [36]. They often perceive their infants to be demanding [37,38] although there is no evidence as to whether PND is a condition which is provoked by the demanding temperament of the child or whether the mothers' perception of the child's behaviour is distorted or made more sensitive to the child's demands by the presence of PND [39-41].

Ambivalent feelings towards pregnancy and child or other stress related situations prenatally may provoke antenatal depression [11]. The maternal depression during the pregnan-

cy may take its toll on the well-being of the foetus. Depressed pregnant woman may eat and sleep less well [42] and are more likely to live unhealthy [43]. Prolonged anxiety and depression can change ability of mother's body to absorb nourishment; therefore newborn babies can be of low weight [44]. Prenatal depression has been clearly associated with the risk of prematurity and/or low birth weight [45]. Besides that, some researchers [46] found that physiological markers of individual differences in infant temperament are identifiable in the foetal period, and possibly shaped by the prenatal environment; that is in this case affected with prenatal depression and therefore exposed to stress hormones [47-49] and effects of biochemical imbalance [50]. Neonates of antenatally depressed mothers, tested with Brazelton Neonatal Behavior Assessment Scale (NBAS) showed inferior performance on orientation, reflex, excitability and withdrawal clusters [51]. Because they were exposed to the high level of stress hormones during the pregnancy, babies of antenatally depressed mothers usually cry more and for longer periods [44] and can be therefore perceived as more demanding by mothers.

Postnatally depression continues to have negative impact on child development [52]; especially from the aspect of the emotional, behavioural, and cognitive functioning [53,54]. PND occurs at a time when the foundation of the mother-child relationship is being laid. It has an effect on the mother's parenting abilities, which can have an adverse impact on the child [4], as the infant's need for love may be unsatisfied [55] and later the communication between them is impaired [4]. Hagen [56] claims women with PND exhibit fewer positive emotions towards their children, are less responsive and less sensitive to infant cues, have a less successful maternal role attainment, and have consequently infants, who are less securely attached. Their parenting style is more punitive; with less positive engagement [4]. Depression could act to weaken parents' ability to regulate child's emotions, potentially affecting temperament development [57]. A depressed mother is less positive, less contingent, and shows less vocal and play interactions to her child. Maternal responsiveness has been viewed as important element of child development that gives infant social, emotional and cognitive competencies [58] and promotes development of communication [59,60]. Therefore some researchers claim that mother's sensitivity is crucial [61], however it is impaired when mother is depressed [62]. Resulting from the mother's depressive symptoms, the infant shows less positive affection, less contingent behaviour [63- 67], sleep and eat less [64] and can have problems in regulating emotions at 7 months; therefore is perceived as child with difficult temperament by mothers [68,69]. A wealth of empirical evidence demonstrates that maternal and parental depression has been strongly associated with an increased incidence of attachment maladaptation, behavioural and emotional problems, altered cognitive and motor development and reduced social interaction abilities in infants [70-76]. Studies showed also poor physical status of infants of depressed mothers [77]; they are at the relative risk to be underweighted, maternal depression predicts poorer growth and frequent illnesses later in childhood [78]. Depressed mothers relate to their infants less and therefore infants of depressed mothers show fewer positive facial expressions [79,80]. Children of depressed mothers might be less active, irritable, can suffer from palpitations and have lower muscle tone [81]. Babies can suffer from micro-depression as they mirror their mother's feelings in order to stay connected to her [82,83]. Mother-infant dyad is often treated as insepa-

rable in the first 3 months after the birth; some [84] naming it the fourth trimester of the pregnancy. Therefore child must be included in the treatment of maternal depression.

Beck [34] writes that depressive mood disorder not only have adverse effects on maternal-infant interaction during the first year of age, but may also have long-term effects on child over the age of one year. There is a more strong connection between maternal depressive mood and infants [85]; long-term paternal depression has affected only male children [40,76]. The mother's on-going depression can cause harmful effects also for siblings and can contribute to emotional, behavioural, cognitive, interpersonal [4,81,86] and psychomotor problems [87] of children later in life. Evidence show that they can be at risk for learning deficit [88]. Besides, children whose mothers develop PND are themselves prone to anxiety, depression and other mental illnesses later in life [45,89,90,91].

2.1.2. Impact of maternal depression on mother – infant interaction

The passing on of life from parent to child is one of the greatest privileges that come to women and man. But with the privilege there comes the responsibility. Most mothers find gratification in the maternal role despite the challenges, however depressed mothers experience less gratification [92].

At the beginning of the newborn's life his survival is completely dependent on another person who feeds, protects and nurtures him. There is evidence emphasising the importance of a quality of early infant – mother, or other caregiver's interaction and the quality of attachment to child's development [93]. One of the unique properties of humankind is the capacity to form and maintain relationships. The importance of effective human relationships lies in the fact that in many ways they determine the quality of our lives [94].

Human development occurs within relationship from the beginning of life. Newborn baby experiences and internalizes what mother experiences and feels. All relationships and encounters with mother, baby, and father during this primary period affect the quality of life and baby's foundation, therefore supportive, loving, and healthy relationships are integral to optimizing primary foundations for baby [95].

There is a clear difference between bonding and attachment. Nevertheless, many healthcare professionals and non-professionals continue to use the terms interchangeably [96]. Bonding is the initial emotional connection mothers make with their newborns [97], whereas attachment which is more complex than bonding [98] is the relationship that develops between mother-baby couple during the first year of the child's life [97] and includes an emotional component that requires time to process [98]. The importance of distinction between bonding and attachment lies in the fact that bonding has not been shown to predict any aspect of child outcome, whereas attachment is a powerful predictor of a child's later social and emotional outcome [96]. Nevertheless, if bonding is disturbed, then maternal-infant attachment can also be interrupted [99]. The maternal-infant attachment begins to develop as early as in pregnancy [100]. The nine month period of pregnancy is not solely concerned with the physical development of the fetus. It is suggested that the development of women into a mother is equally dynamic and integral to the woman's own identity, her role identity, the identity

of the developing fetus and the relationship between them [97]. After birth the production of oxytocin during lactation increases parasympathetic activity which reduces anxiety and foster mother to infant emotional involvement. Maternal oxytocin circulation can therefore predispose women to form bonds and show bonding behaviour [100]. This is also one of the reasons why the first minutes after birth are so important. It is believed that birth and bonding are critical developmental process for mother, baby, and father that form core patterns with life-long implications. The best outcomes for the baby and mother occur when mother feels empowered and supported. The natural process of birth is to be allowed; to unfold with minimal intervention and no interruption in mother-baby connection and physical contact [95]. Sensitive nurturing care is supposed to be the basis of secure attachment [97] which forms the most important basis for the child's psychological growth and development [101].

It is well known, that the postpartum period is the most sensitive period of life for development of mother-child interaction. Childbirth experience and transition to motherhood are very special experiences that make a mother incomparably capable of caring for her child [102]. The first few months of an infant's life have been shown to affect later infant attachment [103]. Because after birth mother's physical and emotional state can be adversely affected by exsostion, pain, anaesthesia, ect. a delay or block in attachment can occur [104].

The first few months after birth could be regarded as a highly sensitive period for the development of the mother–infant relationship [105]. Unfortunately, some mothers find it hard to relate to their new baby, and such failure may have long-term effects on the infant [106]. Nevertheless, bonding is a complex, personal experience that takes time and luckily the baby whose basic needs are usually being met won't suffer if the bond is delayed for some time at first [107].

Even though many researchers have investigated the emotional tie between a mother and her infant [108] studies on attachment are largely focused on attachment from a child's perspective, while studies on attachment of the mother to her child are limited [97]. The research showed that women with more or stronger depressive or anxiety symptoms show less feelings of bonding with their infants. Feelings of hostility, rejection, anxiety and dissatisfaction in the relationship with their newborn infants were noticed [108]. Depressed mothers are often unable to meet their children social and emotional needs and even a mild maternal depression has a significant impact on maternal bonding [105]. This may lead to so called insecure attachment, which is associated with unresponsive, rejecting and insensitive parenting [109].

As shown in Table 1 There are four types of infant-parent attachment; three organized types - secure, avoidant and resistant, and one disorganized type [96].

Quality of caregiving Strategies to deal with distress Type of attachment					
Sensitive	Loving	→	Organized	→	Secure
Insensitive	Rejecting	→	Organized	→	Insecure - avoidant
Insensitive	Inconsistent	→	Organized	→	Insecure - resistant
Atypical	Atypical	→	Disorganized	→	Insecure - disorganized

Table 1. Types of attachment and antecedents [96]

Links between maternal depression and maternal attachment disorganization were made, but as described by George and Solomon [110] the researchers aren't in agreement since the results are inconsistent; some of them found positive while others found negative associations. Nevertheless, children that have disorganized attachment are usually exposed to specific forms of distorted parenting and unusual caregiver's behaviour that are atypical [96]. Because depression can alter behaviour [111] we can say that depressed mothers show atypical behaviour towards their children.

The consequences of disorganized attachment relationships have been the focus of considerable developmental and clinical research in the past two decades [112]. Mostly because there are many consequences of parent–infant disorganized attachment. Disorganized attachment in infancy and early childhood was recognized as a powerful predictor for serious deficits in the child's social, emotional, behavioural functioning [112] and psychopathology and maladjustment in children [113]. Therefore, caregiving behaviours are clearly influential in providing children with the appropriate support to manage and regulate their own emotions and behaviour [114].

Disturbances in maternal–infant interaction may occur even before a baby is born, therefore depressive symptoms during the latter part of pregnancy were found to be an important risk factor for lower maternal attachment [115]. It is clear that mothers with current depressive symptoms and those with histories of severe depressive disorders displayed less positive behaviour toward their children [116], have less balanced attachment style [117] which leads to a mother's inability to interact in a responsive and sensitive manner with her baby and might consequently disrupt the development of secure attachment.

Depressed mothers are more likely to have attachment issues with their infants and their insecurity regarding motherhood further creates an unsteady attachment process [118]. As a consequence the lack of maternal–newborn attachment can cause distress in the newborn, making the newborn fussier and irritable, which in turn causes the new mother more stress and can deepen her own depression and anxiety [118].

2.2. Midwifery skills that enhance mother–infant relationship

By early screening and intervention programmes for PND, it may be possible to avoid the adverse effects of parental depression on child temperament. The nature of the optimum intervention strategy remains to be determined. Although treatments aimed at parental depression undoubtedly have benefits for the parents involved, two well-designed studies [118,119] cast doubt on the idea that treatment of postnatal depression alone is sufficient to prevent adverse child outcomes [40]. The direct relationship between mother and infant is one vital consideration, which can intercept cyclical downward spiral [121]. Much is known about detection and treatment of PND, but less is known about interventions to facilitate re-attachment [122]. Therapies of PND should therefore target also the mother–infant relationship [123] to improve their interaction [50].

2.2.1. *Touch and infant massage*

Touch is the most social sense; it typically implies an interaction with another person. Therefore is an extremely important part of non-verbal communication [124]. Skin is the largest and the most sensitive organ. The skin and the nervous system arise from the same embryonic cell layer (ectoderm). We could consider skin an exposed portion of the nervous system. Therefore some write of the psychological function of the skin [125] and a skin ego [1]. As sir Richard Bowlby said [1] words are not necessary to communicate feelings and develop relationship. Touch has strong effect on our bodies, since stimulation is quickly transmitted to the sensory cortex [126]. Touch can be considered a type of food, necessary for the infant's well-being; on the most basic instinctual level, physical contact is essential to sustain human life [44,127].

The sense of touch is the most developed sense after the birth. It is the first sense developed in utero. The sensory cortex, where touch is consciously perceived, is the most developed area of the brain at birth [128,129]. Early contact stimulation of the baby can begin already from the beginning of pregnancy. Foetus gets continuous massage for the entire nine months by the amniotic fluid and with mother's stroking the abdomen. Despite the fact that the effects of maternal massage in pregnancy are not sufficiently proved [130], researchers [131] claim that women who are being massaged during pregnancy and birth are using more touch stimulation for their newborn infants. Massaging mother during the pregnancy and birth can be therefore beneficial also for the child. Uterine contractions in pregnancy that can be also caused with massaging the belly are perceived by child as touch stimulation. Touch alters oxytocin level and therefore baby is more relaxed [124]. That can be of major importance for the babies whose mothers are suffering for prenatal depression and are therefore exposed to higher levels of stress hormones.

Caring touch plays a critical role in the development of relationship with the child during pregnancy and [132] after the birth. It affects baby's physical and emotional development [129]. It was shown that babies who are touched frequently after the birth develop better; for example score higher on IQ and language tests [133], sleep, eat better and cry less [81]. Massage, as a systematic touch has several positive effects on physical, mental and emotional state of the baby. In infants, massage reduces colic, pain associated with teething, enhance growth, ect. Massage stimulates and promotes growth and development, but at the same time relaxes; lowers levels of hormones that cause tension [124,134]. Infant massage may improve newborn's sleep organization, lowers level of kortizol, helps baby gain weight [129,135-138] and deep touch helps them in organizing [139]. Sensory stimulation like massage speeds myelination of the nervous system, thus enhancing rapid brain-body communication. This has long lasting effects; massage can affect the ability to handle stress in adulthood – baby, who in a womb experienced fear-producing biochemical environment, can unconsciously perceive world as a place of anxiety and fear (his/her structure of cells has been intrauterine programmed as such) and massage can help him/her to reshape this interpretations [44].

Furthermore, massage is likely to nurture the parent as much or more than does the infant, who receives it. Infant massage could be a tool for building mother-infant bond by deeply

communicative means of touch [140]. Massage gives parents an opportunity to realize baby's behavioural cues; signs that child uses for communicating his/her needs [127]. With this they become more sensitive for baby's expressions, which helps them to understand infant [128]. Result is raised self-confidence for acquiring the parenting role, enhanced development of role related skills and perception of lower parental stress [141,142].

Depressed mothers touch their infants less than non-depressed mothers. As a result infants of depressed mothers spend longer periods of time in touching self rather than toys or mother, compensating the lack of positive tactile stimulation [143]. Touch deprivation can have several negative effects on a child, such as sleep disturbance, growth restriction and immune system decompensation [124]. Baby massage can improve the mood of depressed mothers [144] and promotes mother-infant relationship [137]. While other benefits of infant massage are not clearly defined, the evidence for improvements of mother-infant relationship in connection with maternal depression is compelling [145].

2.2.2. Mother-infant relationship and newborn behavioural observation

Newborn Behavioral Observation System (NBO) is a relationship-building, a structured set of observations, designed to help the clinician and parent together, to observe the infant's behavioural capacities and identify the kind of support the infant needs for successful growth and development. The goal of the NBO is to strengthen the relationship between parents and their infant and also to promote a positive relationship between clinician and family. Although the NBO attempts to reveal the full reaches of the newborn behavioural repertoire, the clinical focus is on the infant's individuality and includes observations of the infant's; capacity to habituate to external light and sound stimuli, the quality of motor tone and activity level, capacity for self-regulation, response to stress, and visual, auditory and social interactive capacities [128].

The NBO is based on the assumption that newborns come into the world as competent persons [128] and the sooner the communication between parents and infant is established the greater attachment and less frustration parents may experience.

NBO should become a part of routine family centered midwifery postpartum care [147]. Midwives after birth have the opportunity to enlighten parents about their infants' unique capabilities [146]. The more the parent knows; the better can respond appropriately to the infant without abuse or neglect [146]. NBO promotes active role of parents and can therefore help to establish early attachment between the parents and the newborn which is a foundation for development of a healthy and competent child and later an adult [147].

Healthcare professionals should use the knowledge of newborn behaviour to facilitate connections that parents will use throughout their parenting lives. Using the infant's behaviour as his language, they can sensitize parents to what their infant is "saying" and help parents to accurately interpret baby's cues and respond appropriately.

Interventions such as the NBO that help mothers learn to recognize, understand, and respond to the behavioural cues of their infants could be used with those mothers identified as being at risk for ineffective maternal role transition [148]. NBO can therefore, similar as

found by Jung et al. [121] help the depressed mothers and their families to develop effective ways of managing and comforting the infant when distressed, and to understand the 'meaning' of infant's behaviours and how contingent responses to infant cues increase positive interactions. As a consequence, it is expected that an infant who begins to more frequently show interest in the mother, smile and sustain eye contact, is also likely to evoke more enjoyable and arousing experiences for the mother [121]. Positive responsiveness and involvement between depressed mothers and their infants is very likely to be demonstrated by an increase in the infant's positive emotion expressions while engaged with the mother. Infant's responses to the mother's vocalizations and attempts at engagement encourage the mother to continue [92].

Throughout an NBO session the midwife can encourage depressed mother to explore the knowledge she already possesses about their infant and make predictions and observations. This shared exploration of the infant's responses guides the midwife in providing anticipatory guidance for caregiving and to enhance mother infant relationship. NBO is a family-centered tool [128] and should also include extended family or friends which are in case of a mother's depression more than invited to help embrace, hold, and interact with the infant so that the infant is not deprived of warmth, love, and affection [99].

2.3. Evaluation of the proposed midwifery interventions

Mother needs to be, despite the depression, active participant in the baby's care, not only for the well-being of an infant but also for her own [124]. Therefore midwives should include in the management of postnatally depressed mothers activities that help them building relationship with their babies. Infant massage and NBO seemed appropriate interventions, therefore authors gathered more data on their effectiveness.

2.3.1. Methodology

Since the benefits of infant massage and maternal depression have been clearly shown in past reviews [144,151], the search for the new evidence was performed only for the period from 2008 to 2012. We searched the following databases: Cochrane Library, CINAHL, EMBASE, MEDLINE, ScienceDirect, ProQuest, Springer Link, BMJ Journals, IngentaConnect, Oxford Journals, Embase, Eric and Midirs. For the search, we used key words: postnatal/postpartum/maternal depression AND Infant/baby massage in the title. Exclusion criteria were: non-academic papers. Inclusion criteria were: appropriateness of the content, English language. The search gave 3 results that are discussed below.

The following databases: Cochrane Library, CINAHL, EMBASE, MEDLINE, ScienceDirect, ProQuest, Springer Link, BMJ Journals, IngentaConnect, Oxford Journals, Embase, Eric and Midirs were also searched for evidence of research on NBO and maternal depression. For the search, we used key words: postnatal/postpartum/maternal depression AND newborn behavioural observation in the title but the search didn't give us any results.

2.3.2. Effect of baby massage on maternal depressive symptoms

The results of the recent studies confirm the findings of the past research. O'Higgins et al. [149] performed randomized controlled trial among 62 postnatal women, who scored above 12 on Edinburgh Postnatal Depression Scale (EPDS) at four weeks postpartum. In the control group were 34 women, who scored 9 on EPDS. They were randomly assigned to infant massage course (International Association of Infant Massage – IAIM scheme) or in a group for support intervention. Women in experimental group were tested again with EPDS after six sessions of intervention and after one year. EPDS showed statistically significant improvement in the mood of depressed mothers after the intervention in both groups, but slightly more in the infant massage group. At one year, massage-group mothers had non-depressed levels of sensitivity of interaction with their babies. It can be concluded that infant massage improves mother-infant interaction, consequently preventing possible side effects of maternal depression on child emotional and psychological development, as described in the literature review.

Similar conclusions were made also by Gürol and Polat [150], who performed randomized controlled trial among 117 mother-infant couples, observing attachment before and after 38-days long infant massage intervention, using Maternal Attachment Inventory (MAI). 57 mothers in the experimental group showed statistically significantly higher post-test mean values of the MAI.

Underdown and Barlow [151] performed a research among socioeconomically deprived mothers, who are said to be at higher risk for postnatal depression, due to their life situation. Their sample consisted of 39 mother-infant couples, assigned to eight infant massage classes (using the structure and philosophy of IAIM programme). They collected data with observation, in-depth interviews and quantitatively with several measurement scales, also EPDS. Besides the evaluation of the effect of baby massage course on the mental state of the mother, their aim was also to define crucial elements of good infant massage programme. It became obvious that the important elements of the course are, beside the actual massage, also the topics, discussed during the sessions, especially information on baby's cry and baby's cues that facilitates parents interaction.

3. Discussion and conclusions

Today modern science is rediscovering age-old treatments and the medical sciences are incorporating these interventions into scientific protocols [152]. Touching and understanding baby's behaviour are one of them. As obvious it can be particularly beneficial for women suffering PND.

Teaching depressed mothers and their family member's infant massage and/or go through NBO with them can help them understand the fact that their child is a competent person. Doing infant massage on their own while understanding their child's cues can help depressed mothers to reduce the display of atypical behaviour and therefore avoid or mini-

mize the risk of insecure - disorganized attachment. This is so important because of the negative long-term consequences associated with this condition.

Interventions that focus on what mothers do with their infants instead of focusing only on how they feel can be effective in increasing infants' positive responsiveness and improving infant outcomes. Such interventions can be an essential component of treatment when mothers suffer from PND [121]. Similar conclusions were made by Ewell Foster et al. [116] whose findings highlight the importance of providing parenting interventions for depressed mothers.

Studies of touch and discussion with parents about infant behaviour and temperament showed beneficial effect on postnatally depressed mothers and their infants. There were no side effects mentioned in any study. On the basis of this review, we can conclude that infant massage and NBO could be included into the routine postnatal midwifery care. Infant massage and NBO should therefore become an intervention tool for midwives to support mothers with postnatal depression in order to develop a positive relationship with their newborn children.

More studies relating NBO with postpartum depression are needed, since there is no study directly testing improvements of maternal depressed mood after a session(s) of NBO.

Author details

Ana Polona Mivšek and Tita Stanek Zidarič

*Address all correspondence to: polona.mivsek@zf.uni-lj.si

Faculty of health Ljubljana, Midwifery department, Slovenia

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