

ORIGINAL PAPER

MOTHER-INFANT BONDING IN THE POSTPARTUM PERIOD AND ITS PREDICTORS

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Abstract

Aim: The aim of the study was to assess bonding between a mother and her child with an emphasis on its predictors as well as to identify the women who are at risk of mother-infant bonding disorders. **Design:** A quantitative cross-sectional study. **Methods:** To collect the relevant data, the Postpartum Bonding Questionnaire (PBQ) was used to assess the following four factors: quality of mother-infant bond (F1); rejection and pathological anger (F2); infant-focused anxiety (F3); incipient abuse of infant (F4). The research sample consisted of 200 women who were 0–6 weeks after childbirth. The received data were analysed using descriptive statistics, the Robust ANOVA and the Wilcoxon two-sample test. **Results:** We identified 9.5% at-risk women in the F1; 1.5% at-risk women in the F2; 3.5% at-risk women in the F3; and 5% at-risk women in the F4. The following statistically significant predictors were shown in relation to the F1: child planning; the F3: parity; skin-to-skin contact support after birth. **Conclusion:** Possible predictors and the mothers who are at risk in relation to a secure attachment connection were identified, which is important in terms of preventive interventions on the part of midwives.

Keywords: attachment, bonding, infant, midwives, mothers, postpartum period, skin-to-skin contact.

Introduction

The maternal bond is an emotional and reciprocal relationship between a mother and her child. Its purpose is to attach the infant to its caregivers, to maintain parent's proximity and accessibility. Bowlby's attachment theory reflects the importance of a correlation between early close mother-infant relationships and psychosocial factors for mental health and personality support, also between functional interactions and essential neurobiological processes, including emotional, cognitive, social and other interactions (Hrubý et al., 2011). Attachment between a mother and her child is affected by a multitude of factors, including socioeconomic status, family history, support systems, cultural factors, and last but not least, birth experience. The child-parent relationship plays an important role in facilitating positive social and emotional adaptation of a child throughout life (Groh et al., 2014). Secure attachment is a crucial factor for the child's mental and somatic health. It leads to the

strengthening of adaptive skills, positive social functioning and effective strategies for stress management. Simultaneously, it has a significant positive effect on the child's affective, neuroendocrine and psychosomatic regulation and immunity (Hrubý, 2017). Those children who are securely attached and grow in loving and sensitive environment are generally less likely to suffer from behavioural disorders (Madigan et al., 2016). The maternal bond already begins to develop during the prenatal period (Karakoça & Ozkanb, 2017; Walsh et al., 2014). Klaus et al. (1995) consider the time immediately after childbirth, i.e. in the sensitive phase of motherhood, as the most significant in formation of a strong bond between a mother and her child. There is increasing evidence that sensitive parenting leads to the development of bonding which can be easily established in the early postnatal period by early and uninterrupted skin-to-skin contact (SSC) (Hašto et al., 2014). Postpartum SSC between a mother and her child helps to initiate behavioural mechanisms that strengthen attachment connection and simultaneously help the newborns to better adapt to life (Hrubý, 2017). Increase in oxytocin from SSC immediately after birth and during lactation enhances development of the mother-infant relationship and

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moreover, exerts beneficial anxiolytic, analgesic and anti-inflammatory effects (Kaščáková & Hašto, 2018). SSC increases the feeling of safety in a newborn, improves the quality of breastfeeding, reduces crying and the release of stress hormones, and has both an immunological and thermoregulatory function (Hendrych Lorenzová et al., 2018; Mazúchová et al., 2016). Attachment and bonding support in the form of postpartum SSC at least until the first breastfeeding corresponds to the congenital program of mother and child and has a beneficial effect on mother, child and their mutual relationship (Hašto et al., 2014). It directly affects both mother and newborn physiologically, psychologically and emotionally. A strong bond between a mother and her child leads to positive results and affects their relationship throughout life (Barker et al., 2017). It also plays a role in preventing postpartum depression (Banovcinova et al., 2019; Reck et al., 2016). A part of the baby blues or even postpartum depressions may be related to the woman's separation from her child, as her maternal instinct of a care giver, which is naturally biologically encoded in every mammalian female, is not fulfilled (Hašto et al., 2014). It is a vicious circle. According to Paris et al. (2009), symptoms of depression in mothers are the strongest predictors of mother-infant bonding disorders. It is important to assess maternal mental health in pregnancy. Simultaneously, the identification of stress and depressive symptoms in pregnancy may open the space for interventions to reduce these symptoms and improve bonding (Rossen et al., 2016). Severe and persistent maternal depression symptoms are associated with adverse mental health outcomes for children (Netsi et al., 2018; Wang et al., 2018). Plenty of scientific evidence shows the direct interaction between attachment and the development of personality; thus insecure attachment can develop into psychopathology. Etiopathogenesis of various psychic and psychosomatic disorders (anxiety disorders, social phobias, panic disorders, depression, etc.) which are manifested in adulthood, find their roots in early childhood, when the attachment process was broken or not even properly developed (Belsky & Nezworski, 2015; Hrubý, 2017; Mikulincer & Shaver, 2010).

Various instruments have been developed to detect and prevent bonding disorders. Measuring mother-infant bonding disorders facilitates early intervention. Of the existing instruments, we have focused on the Postpartum Bonding Questionnaire (PBQ). The PBQ was developed to assess mother-infant bonding disorders in the postpartum period (Brockington et al., 2001, 2006).

Aim

The aim of the study was to assess bonding between a mother and her child with an emphasis on its variable criteria (predictors) as well as to identify the women who are at risk for mother-infant bonding disorders.

Methods

Design

A quantitative cross-sectional study was used.

Sample

The research female participants (n = 200) were recruited in three paediatric outpatient clinics of the Slovak Republic, Žilina Region. They were addressed by the trained nurses in the paediatric outpatient clinics in the frames of the preventive health check-ups for children in the period from October 2016 to January 2018.

A convenience sampling method was used. The sample consisted of women who fulfilled the following inclusion criteria: women aged 18 years old and more, who were 0–6 weeks after childbirth and whose children were born within the normal gestational period and with a birth weight of 2,500–4,000 g, women willing to cooperate, and having signed their written consent to participation in the research study. Women who gave birth to twins were excluded.

The characteristics of the sample with respect to the variable criteria (i.e. the predictors: age, educational attainment, parity, planning for pregnancy, postpartum bonding support in form of SSC) are presented in Table 1.

Data collection

The PBQ (Brockington et al., 2001, 2006), serving as a screening tool for detection of bonding quality between mother and child as well as detection of problems in early diagnosis of bonding disorders, was used to collect the data. The questionnaire was translated into Slovak through the method of back-translation. It consisted of 25 questions evaluated using the 6-point Likert scale. The lowest possible score was 0 and the maximum score was 125. The higher the average scale value of responses, the worse (less safe / lower quality) the mother-infant relationship evaluation. The questionnaire assessed the four factors, each with a defined numerical limit for normality. Boundary values reflect the possible occurrence of risk factors and thus, an insecure type of mother-infant relationship. The first general factor examined the *quality of the bond* (emotion, affection) between mother and child and consisted of 12

questionnaire items with a maximum score of 60, where the risk values were 12 and more. The second factor of *rejection and pathological anger* consisted of 7 questionnaire items with a maximum score of 35, where the risk values were 17 and more. The third factor of *infant-focused anxiety* consisted of 4 questionnaire items with a maximum score of 20, where the risk values were 10 and more. The fourth factor of *incipient abuse of infant* consisted of 2 questionnaire items with a maximum score of 10, where the risk values were 3 and more.

The internal consistency reliability (the Cronbach alpha reliability) coefficient of the PBQ in this research was 0.94.

The questionnaire was supplemented by research variables (age, educational attainment, parity, planning for pregnancy, postpartum bonding support in the form of SSC) essential for the research set characteristics as well as for the evaluation of the links between these items and the mother-infant relationship.

The clarity of the questionnaire was verified by a pilot study with five respondents. Based on the piloting, problematic formulations of a formal and/or stylistic character were modified.

The research female participants, who agreed to take part in the research project were instructed in how to complete the questionnaire. The questionnaire could be completed either in a printed form during visits to the paediatric outpatient clinics, or in an electronic form, sent to the e-mail addresses of the participants, if required. A total of 243 questionnaires were distributed: 70 questionnaires were given out personally in the paediatric outpatient clinics and had a response rate of 81.4%; 173 questionnaires were sent electronically to e-mail addresses and had a response rate of 85.6%. The total response rate was 84.4%. Out of a total of 205 completed questionnaires, 5 were excluded due to their non-compliance with the inclusion criteria. As a result, a total of 200 questionnaires were used for the study research.

Data analysis

The data on the average score were summarized by the mean, standard deviation, median Inter-Quartile Range. The normality of the average score was assessed visually using the Quantile-Quantile plot with 95% confidence band constructed by the bootstrap. The normality was also formally tested by the Shapiro-Wilk test. Since the average scores had a highly skewed, non-gaussian distribution, the robust ANOVA was used instead of the classic ANOVA wherever the factor had more than two levels. Where the p-value from the robust ANOVA

was ≤ 0.05 cut-off, the test was followed by the Wilcoxon two-sample test for the equality of the population medians. A test result with a p-value ≤ 0.05 was considered statistically significant. The data were analysed in R (R Core Team, 2018) version ver. 3.5.2, using the libraries WRS2 (Mair & Wilcox, 2018), RVAideMemoire (Hervé, 2019), DescTools (Signorell et al., 2019) and car (Fox & Weisberg, 2011).

Results

The analysis of the basic characteristics of participants showed, that the most represented female age groups were women aged 21 to 30 (64%) and women aged 31 to 40 (36%). Most women (50.5%) were with university education and 48.5% were with secondary school education. In terms of parity, the research group consisted of 63.5% of primiparas and 36.5% of multiparas. Most respondents (76%) reported their pregnancy as planned while 24% reported it as unplanned. In terms of postpartum bonding support according to the recommended procedures (i.e. immediate and uninterrupted SSC, possibly with a short interruption due to a newborn physical examination, lasting at least 3/4 hour) 30.5% of the women answered they had been given it while 69.5% of the women had not been given it (Table 1).

Table 1 Basic characteristic of participants

Characteristic (n = 200)	n (%)
Age	
18 to 20 years old	8 (4)
21 to 30 years old	120 (60)
31 to 40 years old	70 (35)
41 to 50 years old	2 (1)
Education	
with university education	101 (50.5)
with secondary school education	97 (48.5)
with only primary education	2 (1)
Parity	
primiparous	127 (63.5)
multiparous	73 (36.5)
Child planning	
yes	152 (76)
no	28 (24)
Support of SSC	
yes	61 (30.5)
no	139 (69.5)

The analysis of the PBQ showed, that in the F1, the highest average score was for the questionnaire entries: “My baby cries too much” ($x = 1.65 \pm 1.18$) and “I wish the old days when I had no baby would come back” ($x = 0.72 \pm 0.97$) (Table 2).

In the F2, the highest average score was for the questionnaire entries: “I feel distant from my baby” ($x = 0.48 \pm 0.81$) and “I enjoy playing with my baby” ($x = 0.43 \pm 0.88$).

In the F3, the highest average score was for the questionnaire entries: “My baby is easily comforted” ($x = 1.36 \pm 1.25$), “My baby makes me feel anxious” ($x = 0.37 \pm 0.83$) and “I feel confident when caring for my baby” ($x = 0.35 \pm 0.91$).

Table 2 Postpartum Bonding Questionnaire (PBQ), Factor 1

Questions in PBQ	x	SD	Median
Factor 1 Quality of the bond			
1. I feel close to my baby	0.42	0.78	0
2. I wish the old days when I had no baby would come back	0.72	0.97	0
3. The baby does not seem to be mine	0.13	0.51	0
4. My baby winds me up	0.34	0.94	0
5. I love my baby to bits	0.19	0.68	0
6. I feel happy when my baby smiles or laughs	0.17	0.69	0
7. My baby cries too much	1.65	1.18	2
8. My baby irritates me	0.58	0.88	0
9. I feel trapped as a mother	0.66	0.97	0
10. I resent my baby	0.13	0.49	0
11. My baby is the most beautiful baby in the world	0.23	0.69	0
12. I wish my baby would somehow go away	0.14	0.52	0

x – Scale response average; *SD* – standard deviation; In the following questions (1, 5, 6, 11) reverse scoring was applied.

In the F4, the highest average score was for the questionnaire entry: “I feel like hurting my baby” ($x = 0.23 \pm 0.63$) (Table 3).

The highest average score was shown in the factor *Quality of the bond*, while the lowest one in the factor *Incipient abuse of infant*. The total average score of

PBQ was 10.46 (± 13.13). Most women at risk (9.5%) were in the F1, then in the F4 (5.0%), and then in the F3 (3.5%). The lowest number of the women at risk (1.5%) were in the F2 (Table 4).

Child planning ($p = 0.038$) was shown to be statistically significant predictor in relation to the F1 (Quality of the bond). The women who had planned their child developed a better quality bond with the child than those women who had not planned it. The 95% CI (confidence interval) between the women who planned and those who did not plan their child was -0.25, 0.00.

In the F2 (Rejection and pathological anger) no statistical significance of any variable was demonstrated.

Table 3 Postpartum Bonding Questionnaire (PBQ), Factor 2, 3, 4

Questions in PBQ	x	SD	Median
Factor 2 Rejection and pathological anger			
13. I feel distant from my baby	0.48	0.81	0
14. I love to cuddle my baby	0.42	0.85	0
15. I regret having this baby	0.15	0.54	0
16. I enjoy playing with my baby	0.43	0.88	0
17. I feel angry with my baby	0.27	0.71	0
18. My baby annoys me	0.41	0.75	0
19. I feel the only solution is for someone else to look after my baby	0.21	0.70	0
Factor 3 Infant-focused anxiety			
20. My baby makes me feel anxious	0.37	0.83	0
21. I am afraid of my baby	0.29	0.82	0
22. I feel confident when caring for my baby	0.35	0.91	0
23. My baby is easily comforted	1.35	1.25	1
Factor 4 Incipient abuse of infant			
24. I have done harmful things to my baby	0.16	0.56	0
25. I feel like hurting my baby	0.23	0.63	0

x – Scale response average; *SD* – standard deviation; In the following questions (14, 16, 22, 23) reverse scoring was applied

Table 4 Factors of PBQ and the respondents at risk

Factors	Max Raw score	x	SD	Risk	n (%)
F1	60	5.34	6.48	≥ 12	19 (9.5)
F2	35	2.37	3.82	≥ 17	3 (1.5)
F3	20	2.37	2.80	≥ 10	7 (3.5)
F4	10	0.39	1.10	≥ 3	10 (5.0)
Total	125	10.46	13.13	-	-

F1 – Quality of the bond; F2 – Rejection and pathological anger; F3 – Infant-focused anxiety; F4 – Incipient abuse of infant; Max Raw score – maximum questionnaire raw score in individual factors, *x* – average score, *SD* – standard deviation

Parity ($p = 0.050$) and SSC support after birth ($p = 0.047$) were shown to be statistically significant predictors in relation to the F3 (Infant-focused anxiety). The multiparas had felt less anxiety from the child than the primiparas. The 95% CI between the multiparas and the primiparas was 0.00, 0.25. Those women who had SSC with the child after birth felt less anxiety from the child than those women

who did not have SSC after birth. The 95% CI between the women who had SSC with the child after birth and those who had no SSC support after birth was -0.25, 0.00.

In the F4 (Incipient abuse of infant) no statistical significance of any variable was demonstrated. (Table 5).

Table 5 Examined predictors of PBQ

Variables/factors	F1	F2	F3	F4
	p-value* (95% CI)	p-value*	p-value* (95% CI)	p-value*
age	0.230 ^a	0.280 ^a	0.226 ^a	0.50 ^a
education	0.489 ^a	0.59 ^a	0.339 ^a	0.719 ^a
parity	0.183 ^b	0.554 ^b	0.050 ^b (0.00, 0.25)	0.579 ^b
child planning	0.038 ^b (-0.25, 0.00)	0.323 ^b	0.863 ^b	0.491 ^b
SSC	0.086 ^b	0.108 ^b	0.047 ^b (-0.25, 0.00)	0.095 ^b

* $p \leq 0.05$; ^arobust ANOVA; ^bWilcoxon two-sample test; 95% CI – 95% confidence interval for the difference of the median

Discussion

Using the PBQ questionnaire, we evaluated four postpartum attachment/bonding factors. The F1 concerned the quality of the maternal bond (emotions, affection) with the child. The worst score was for the questionnaire item: “My baby cries too much” (Table 2). Kommers et al. (2017) links the rate of children crying with the prenatal mother-infant attachment quality. He indicates that the mothers with lower attachment scores reported having excessively crying children. In relation to this factor, 9.5% of the respondents were evaluated as ones at risk (Table 4). However, according to Kaneko & Honjo (2014) the score in this factor was only 7.7%. The increased risk of mother-infant bonding disorders can be caused by many factors, which are as follows: a) misinterpretation of the child’s signals; b) postnatal mother-infant separation; c) unplanned pregnancy; d) insufficient maternal self-esteem; e) inappropriate socio-economic situation; f) lack of support from one’s close surroundings; g) lack of maternal knowledge, experience and skills. These and many other possible factors are involved in the mother-infant attachment and bonding quality. The quality of the mother-infant bond naturally affects levels of trust, love, protection and extended breastfeeding (De Falco et al., 2014). Sensitive parenting promotes a secure relationship, which is predictively associated with positive outcomes in many areas of development in children (Bernier & Meins, 2008). Secure attachment and bonding are important factors in the emotional and cognitive adaptation and healthy emotional development of children, affecting their behaviour in adulthood, too. Secure bonding has two important functions: it

provides the child with emotional security and allows him/her to discover the world around. Securely bonded children receive lots of nurturing contact, adequate care, protection and support, and thus experience psychological freedom, which allows them to explore the world around (Brisch, 2011; Dexter et al., 2013).

The F2 in PBQ was related to maternal rejection and pathological anger towards the infant. The worst score was for the questionnaire item: “I feel distant from my baby” (Table 3). In relation to this factor 1.5% of the respondents were evaluated as at risk (Table 4). However, according to Kaneko & Honjo (2014) the score for this factor was only 0.4%. Children with insecure avoidant attachment are exposed to constant rejection by their mothers, which may lead to pathological behaviour or aggression later in life. These children complain more often of nausea, headache and abdominal pain and also suffer from vomiting and sleep disorders. All these symptoms are the manifestations of stress experienced by these children as a result of rejection and insecure attachment behaviour. The children with insecure ambivalent attachment behaviour are frequently used to solving conflicts by verbal aggression. In some cases, these children appear helpless and passive. Compared to securely bonded children, the memory, endurance, flexibility and communication skills of these children are not very well developed, which contributes to their worse school results (Brisch, 2011).

The F3 in PBQ was related to infant-focused anxiety. It is hypothesised that a mother who experiences

anxiety in relation to her child, is not confident enough in her maternal skills, which can consequently lead to improper interpretation of the child's signals. And all such conditions entail the self-reinforcing activity of a vicious circle of discontent. Therefore, in terms of mother-infant relationship quality, maternal anxiety in relation to the child is perceived as a risk factor. The worst score was for the questionnaire item: *"My baby is easily comforted"* (Table 3). In relation to this factor 3.5% of the respondents were evaluated as being at risk (Table 4). However, according to Kaneko & Honjo (2014) the score in this factor was only 2.2%. It has been proved that maternal anxiety directly affects the mother-infant relationship (Nicol-Harper et al., 2007). Maternal anxiety negatively affects the level of stress tolerance in the child, which may lead to the development of insecure attachment (Brisch, 2011).

The F4 in PBQ was related to the incipient abuse of infant by mother. The worst score was shown in the questionnaire item: *"I feel like hurting my baby"* (Table 3). In relation to this factor 5% of the respondents were evaluated as being at risk (Table 4). In light of the severity of this factor, we have considered the identified number of at-risk respondents to be alarming. According to Kaneko & Honjo (2014) the score in this factor was 0.08%. Childhood abuse and neglect are related to several maladaptive outcomes during motherhood, including an increased risk of postnatal psychopathology, which is likely associated with the mother-infant bonding disorders (Cyr et al., 2010). Dubber et al. (2015) concluded that a negative mother-infant bonding could increase the risk of child abuse or neglect. Inadequate bonding is associated with the mother's depression and emotional state. Equally, a mother's depression or emotional shifts in some cases correlate with child abuse or neglect. Many other findings confirmed that the major risk factors in depression and post-traumatic stress disorder (PTSD) of the mother are child abuse and neglect (Koenen & Widom, 2009).

Another risk group of women in relation to child abuse are women with their own history of child abuse. Particular attention and care should be given to this group of women due to their increased susceptibility to the development of psychopathology in the postpartum period (Muzik et al., 2013).

Children with insecure attachment are more likely to develop mental disorders in increased mental stress situations, and this can seriously endanger their healthy mental development (Brisch, 2011). Secure attachment can serve as a buffer zone against the negative consequences of stress (Gilissen et al.,

2008). The healthy development of the child is largely influenced by parent-child interaction and the secure mother-infant attachment is presciently linked to positive outcomes in many areas of the child development. However, other predictors, which we also focused on in our research, can also influence attachment quality. *Child planning* was shown to be statistically significant predictors in relation to the F1; *parity* and *SSC support after birth* in relation to the F3 (Table 5). Based on the findings, we can conclude that the risk predictors of bonding are multiparas, unplanned pregnancy and the lack of SSC support after birth.

In relation to SSC support after birth, only one third of all respondents reported that bonding support had been performed according to the recommended procedures (i.e. immediate and uninterrupted SSC, possibly with a short interruption due to a newborn physical examination, lasting at least 3/4 hour) (Table 1). The same outcomes were demonstrated in the study by Mazúchová et al. (2016), which revealed that the most common reasons for not supporting bonding had been hospital routine and reluctance of medical staff. Kaščáková & Hašto (2018) reported that routine measures in maternity hospitals, interventions during labour (surgical and medical), as well as stress stimuli from the environment may interfere with the natural biological regulations of the woman and make her maternal adaptations, likewise newborn/baby adaptations difficult to develop. Several studies have confirmed the positive association between SSC and bonding quality (Dalbye et al., 2011; Phillips, 2013). SSC immediately after birth triggers the onset of maternal behaviour towards the child. The mother can easily decipher the child's needs and can adequately respond to them, thus providing a precondition for secure mother-infant attachment. On the other hand, those women who were separated from their children after birth often experience child-related disorders (over-protective or denial behaviour, feelings of mistrust in their own parental abilities) (Bryanton et al., 2008). SSC is both the best and most undemanding intervention on the part of nurses and midwives reducing stress, anxiety and pain perception in the mother, as well as *"the stress of being born"* in the newborn (Kaščáková & Hašto, 2018). Midwives are expected to increase their efforts in application of their evidence-based practice and thus replace the perinatal routine nursing procedures concerning the woman in labour and the neonate. It is essential to support uninterrupted SSC immediately after birth, and thus foster the development of secure attachment, so important to both the infant and the mother.

The concept of mother-infant bonding is relevant to and recognizable in clinical practice (Bicking Kinsey & Hupcey, 2013). A midwife can detect bonding disorders from observation of the mother's behaviour as well as with the help of screening instruments for bonding impairments.

Limitation of study

Certain limitations were inherent to the nature of the research (i.e. online questionnaires, convenience sample, and the number of respondents). Since this is a preliminary study, it did not allow causal conclusions and its external validity is limited. The validity and reliability of the translated questionnaire was not verified in our socio-cultural environment. Therefore, it is not obvious whether the instrument actually measured what it had been intended to in the original English version of the questionnaire or whether it was sufficiently accurate and reliable in Slovakia either. The revised version of the questionnaire was used only for the purposes of this study. Our future goal is to validate the questionnaire for the Slovak Republic using a larger sample of people. Further study limitations can be seen in the uneven distribution of the file by age, education, parity, child planning, skin-to-skin contact support, all of which could have distorted the results. Similarly, the factors that are linked to bonding quality are also considered limiting. We realize that many other factors, such as partnership, social environment, family financial status, family mental health history, as well as the support and assistance of family members in childcare also influence mother-infant bonding quality. As a result, based on our research, it cannot be argued that only the examined variables are related to bonding quality. We can consider our study as partial, and notwithstanding the mentioned research limitations, we believe that the study has arrived at challenging and compelling results.

Conclusion

The study has shown the possible predictors of the postpartum mother-infant bonding quality and identified the mothers at risk in relation to a secure attachment connection. The significance of the secure mother-infant attachment has long-term positive consequences for both disorders by observing the mother-infant relationship in the postnatal period and thus become able to identify the mothers at risk as soon as possible. Also, they could contribute to the development of appropriate mother and child. Midwives could be involved more significantly in the prevention of bonding conditions for postpartum bonding support. It is thus desirable to create

a concept of secure attachment tailored to suit our conditions as this is a crucial and protective factor in terms of mother-infant care and health.

Ethical aspects and conflict of interest

The study was approved by the Ethical Commission of the Žilina (Number EC: 05404/2016/OZ-05) Self-Governing Regions (Slovak Republic). All participants received full information about the nature and goals of the research, as well as about the details connected with their involvement in the study. The data collection was anonymous, and all participants expressed their willingness to be included in the study, attaching their informed consent. The authors declare and confirm that there are no known conflicts of interest associated with this publication.

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Author contributions

The concept and study design (LM, AP), data analysis and interpretation (LM, MG), processing the draft of the manuscript (LM, SK, AP), critical revision of the manuscript (LM, SK, NM), article finalization (LM, NM).

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