Breastfeeding and postpartum depression: state of the art review

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Received 9 October 2012; accepted 13 December 2012
Available online 20 June 2013

Abstract

Objective: To review the literature on the association between breastfeeding and postpartum depression.
Sources: A review of literature found on MEDLINE/PubMed database.
Summary of findings: The literature consistently shows that breastfeeding provides a wide range of benefits for both the child and the mother. The psychological benefits for the mother are still in need of further research. Some studies point out that pregnancy depression is one of the factors that may contribute to breastfeeding failure. Others studies also suggest an association between breastfeeding and postpartum depression; the direction of this association is still unclear. Breastfeeding can promote hormonal processes that protect mothers against postpartum depression by attenuating cortisol response to stress. It can also reduce the risk of postpartum depression, by helping the regulation of sleep and wake patterns for mother and child, improving mother’s self-efficacy and her emotional involvement with the child, reducing the child’s temperamental difficulties, and promoting a better interaction between mother and child.
Conclusions: Studies demonstrate that breastfeeding can protect mothers from postpartum depression, and are starting to clarify which biological and psychological processes may explain this protection. However, there are still equivocal results in the literature that may be explained by the methodological limitations presented by some studies.

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PALAVRAS-CHAVE
Amamentação; Depressão na gravidez; Depressão pós-parto; Hormônios

Amamentação e depressão pós-parto: revisão do estado de arte

Resumo

Objetivo: Revisar a literatura sobre a associação entre a amamentação e a depressão pós-parto.

Fontes: Uma revisão da literatura encontrada na base de dados MEDLINE/Pub-Med.

Resumo dos achados: A literatura mostra, de forma consistente, que a amamentação fornece uma ampla quantidade de benefícios tanto para a criança quanto para a mãe. Ainda são necessárias mais pesquisas sobre os benefícios psicológicos para a mãe. Alguns estudos apontam que a depressão na gravidez é um dos fatores que pode contribuir para a não amamentação. Outros estudos sugerem, também, uma associação entre amamentação e depressão pós-parto, não estando clara ainda a direção dessa associação. A amamentação pode promover processos hormonais que protegem as mães contra a depressão pós-parto por atenuar a resposta do cortisol ao estresse. É isso também pode reduzir o seu risco, por auxiliar na regulação dos padrões do sono e vigilia da mãe e do filho, melhorando a autoeficácia e o envolvimento emocional da mãe com a criança, reduzindo as dificuldades de temperamento e promovendo uma melhor interação entre eles.

Conclusões: A pesquisa aponta que a amamentação pode proteger as mães da depressão pós-parto e começa a esclarecer que processos biológicos e psicológicos podem explicar essa proteção. Contudo, ainda existem resultados ambíguos na literatura que poderão ser explicados pelas limitações metodológicas apresentadas por alguns estudos.

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Introduction

Breastfeeding has been associated with the well-being of both the child and the mother. Breastfeeding benefits for children’s physical and psychological status include decreased risk of infectious diseases and obesity, decreased blood pressure, lower cholesterol levels,1,2 and increased cognitive and motor performance.3,4 Positive health-outcomes for the mother’s physical health include decreased blood pressure and risk of breast and ovarian cancer;5–7 for the mother’s psychological health they include attenuated stress response8–12 and enhanced sleep.13,14 However, benefits for the mother’s psychological well-being need more supportive empirical evidence.15

The World Health Organization (WHO),16 the European Commission for Public Health (ECPH),17 and the American Academy of Pediatrics (AAP)18 recommend exclusive breastfeeding for the first six months of life. Despite the established benefits of breastfeeding, rates are still low, and even though rates of breastfeeding initiation are high, there is a marked decline in breastfeeding during the first few weeks after initiation, and exclusive breastfeeding is rare. In Portugal, despite the high rate of breastfeeding at the time of hospital discharge (91%19 and 98.5%20), an accentuated decrease is observed in the following months, with only 54.7%19 to 55%20 of mothers breastfeeding at three months postpartum, and 34.1%19 to 36%20 at six months postpartum. The national health surveys provided by the Portuguese Health Ministry showed that breastfeeding initiation rates increased from 81.4% in 1995/1996 to 84.9% in 1998/1999.21 In 2010/2011, this percentage ascended to 98.5%.22 However, despite the increase in breastfeeding rates, these surveys also show a decrease in breastfeeding over the months. In 2010/2011, in baby-friendly hospitals, between 65.2% to 72.5% of mothers exclusively breastfeed their babies by the time of hospital discharge. At three months postpartum, the percentage of exclusive breastfeeding was 40.3%, falling to 14.7% at five months.22 The European rates of breastfeeding initiation vary from 63% in Belgium to 99% in Norway.23 After hospital discharge, rates start to fall and at six months the percentage of mothers who continue to breastfeed varies from 10% in Belgium to 80% in Norway.23 Scandinavian countries present the highest rates of breastfeeding at six months postpartum (80% in Norway, 72% in Sweden, and 65% in Iceland).23 In Brazil, a national survey conducted in 2008 showed a rate of 41% of exclusive breastfeeding in babies from 0 to 6 months.24 In the same survey, the percentage of breastfeeding in babies from 9 to 12 months old was approximately 58.7%.24

Therefore, identification of women at risk for early cessation of breastfeeding and implementation of effective breastfeeding promotion strategies are considered health priorities.

Breastfeeding and depression in pregnancy and postpartum depression

Recent literature reviews suggest that breastfeeding is less common among depressed mothers, even though their infants benefit from breastfeeding.25,26 Studies from different socio-cultural contexts show almost unequivocally that depressed mothers tend to breastfeed less or for less time than non-depressed mothers. However, the association between breastfeeding and postpartum depression remains equivocal.25,27

When depressed during pregnancy, women are less likely to initiate28,29 or to maintain breastfeeding,30–32 compared with those with no depressive symptoms. In a recent study on the association between prenatal psychosocial risk factors
and breastfeeding intention of Hispanic women, researchers
found that women who scored higher in depression at the
middle of gestation (about 25.7 weeks) and women who
showed persistent depressive symptoms during pregnancy
presented a lower intention to breastfeed their babies.13
Other studies have shown that 1/5 of pregnant women
are depressed at the third trimester of pregnancy,24,25 and
that half of these depressed pregnant women will not ini-
tiate or breastfeed for three months or more.26 Depres-
sion scores at the third trimester were the best predictors of
the length of exclusive breastfeeding, and when considering all
the mothers not breastfeeding at three-month postpartum,
37% could be easily detected because of depression during
pregnancy.26 Results also showed a significant decrease in
breastfeeding scores from childbirth to three months postpar-
tum in women who maintained exclusive breastfeeding for
three or more months.30

Exclusive breastfeeding appears to be significantly lower
among depressed mothers.36-39 Mothers who do not initiate
or maintain breastfeeding are more at-risk for depression
during the postpartum period.50,40-43 Moreover, when moth-
ers are depressed in the postpartum period, they tend to
not initiate48,29 or maintain breastfeeding.27,26,44-50

Some studies have shown that postpartum depression
emerges in the sequence of and may result from breast-
feeding interruption,40-43 suggesting that early cessation
of breastfeeding may be involved in the cause of post-
partum depression. For example, an association between
negative early breastfeeding experiences and depressive
symptoms at two months postpartum was found.51 Another
study that aimed to assess the association between the
infant feeding method and depressive symptoms showed
that breastfeeding initiation among multiparous mothers
was associated with significantly decreased odds of postpar-
tum depression.45

Other studies suggest that postpartum depression may be
involved in the cause of early breastfeeding cessation, and
that depressive symptoms have been observed to precede
the cessation of breastfeeding.27,46,49,52-55 For example, a
recent study screening for depression levels immediately
after delivery demonstrated that mothers with higher levels
of depressive symptoms have a higher likelihood to bottle-
feed their infants at three months postpartum.38 Results
also showed that the odds of bottle-feeding increased with
the severity of maternal depression.38 Another recent study
indicated an association between breastfeeding cessation
at four months postpartum and higher depressive symp-
toms at one month after delivery, showing that mothers
who continued to breastfeed at four months had lower
depression scores at one month than those who stopped
breastfeeding.36

Research has also been focusing on the association
between breastfeeding and depression in pregnancy and
postpartum depression. A recent study showed that higher
levels of depression and anxiety during pregnancy were
associated with breastfeeding cessation, and that breast-
feeding cessation predicted higher levels of anxiety and
depression after birth.55 Moreover, the results showed an
interaction effect between anxiety and depression levels
at pregnancy and six months postpartum and breastfeed-
ing cessation, so that baseline levels anxiety and depression
are increased at six months postpartum by the effect of
breastfeeding cessation.55 Another recent study on the asso-
ciation between breastfeeding and depression in pregnancy
and postpartum depression concluded that higher depres-
sion scores at the third trimester of pregnancy predicted
lower exclusive breastfeeding duration.30 This study also
found a decrease in depressive symptoms in women who ini-
tiated or maintained exclusive breastfeeding for three or
more months.30

The association between breastfeeding and depression
has also been studied, taking into account both parents. A
study undertaken to trigger the association between breast-
feeding and mental health of both the parents concluded
that the simultaneous presence of mental disorders in both
the mother and the father was not associated with the
early breastfeeding cessation (before four months).56 How-
ever, mothers tended to breastfeed for a longer period of
time when they felt that their partners actively supported
breastfeeding.56

Breastfeeding and hormonal protection to
postpartum depression

Research has been showing that breastfeeding promotes
hormonal and psychological conditions and processes that
are inversely associated with postpartum depression. How-
ever, the simultaneous study of these dimensions and their
potential explanatory value in the connection between
breastfeeding and pre- and postpartum depression has not
yet been accomplished.

"It is possible that the positive effects of breastfeed-
ing may outweigh the positive effects of antidepressants"26
Even when the potential harmful effects of medication are
taken into account, some studies suggest that women with
postpartum depression who are taking antidepressant should
not discontinue breastfeeding.57 Lactogenic hormones, oxy-
tocin and prolactin, are associated with anti-depressant and
anxiolytic effects.53 Some studies suggest that breastfeed-
ing may have a protective effect on maternal psychological
health because it attenuates stress responses.15,58,59 Lacta-
tion has been associated with attenuated stress responses,
especially that of cortisol.8-12 Attenuated cortisol stress
responses,8-10 as well as attenuated total cortisol and
free cortisol stress responses,11 were observed in lactat-
ing mothers compared to the non-lactating. These results
suggest that lactation attenuates neuro-endocrine responses
to stress,8 a factor that has been related with fewer post-
partum depressive symptoms.40-42 In a recent study on
maternal adrenocorticotropin hormone (ACTH) and cortisol
release patterns during a breastfeeding session, researchers
found that breastfeeding was associated with a significant
decrease in ACTH and cortisol levels.13 Skin-to-skin contact
before sucking the breast was shown to play an important
role in the reduction of these levels; the longer the dura-
tion of skin-to-skin contact, the lower the maternal cortisol
levels.13

Additionally, the usual diurnal pattern of cortisol, consist-
ing of high morning levels and gradual decline throughout
the day (also associated with fewer postpartum depressive
symptoms),64 was found to be more common in
multiparous breastfeeding women compared with the non-
breastfeeding.13 Despite the fact that some studies did
not report differences in daily cortisol levels in depressed pregnant or postpartum women,\textsuperscript{6,65–67} cortisol has also been found to be lower,\textsuperscript{68} as well as higher in depressed mothers when compared with their non-depressed counterparts.\textsuperscript{60,68} A recent study suggested that depressed mothers present a down regulated HPA axis, showing lower salivary cortisol levels compared with non-depressed mothers.\textsuperscript{62} Conversely, another recent study found significantly higher levels of serum cortisol in the group of depressed mothers.\textsuperscript{69} A different diurnal pattern of cortisol, with higher cortisol levels at waking and no increase from waking to 30 minutes (compared to a significant increase in cortisol levels from waking to 30 minutes found in non-depressed women), was reported in postpartum depressed women.\textsuperscript{64}

These data support the possibility that postpartum depression may be associated with a deregulated HPA axis. However, empirical evidence is equivocal, probably due to the presence of a variety of procedures (for example, diurnal pattern or daily cortisol levels in saliva, blood, or urine) to measure different HPA axis functions.

Results suggest that breastfeeding might promote a tighter regulation of diurnal basal cortisol secretion,\textsuperscript{8–12} and the stability of diurnal cortisol secretion lowers the risk of postpartum depression.\textsuperscript{64} However, most studies regarding postpartum depression do not control for breastfeeding, and most studies about breastfeeding do not control for depression. In addition to the high correlation between breastfeeding and depression in studies, there is a possible effect of these variables on the functioning of the HPA axis.

**Breastfeeding and psychological protection from postpartum depression**

Another important associated change during breastfeeding relates to the regulation of sleep and wake patterns for both the mother and the child, helping the mother to feel less tired, which could also prevent symptoms of depression. Parents of infants who were exclusively breastfed slept an average of 40-45 minutes more and self-reported less sleep disturbance than parents of infants given formula.\textsuperscript{14} Women with postpartum depression experienced poorer sleep than women without postpartum depression, and sleep quality worsened with increasing postpartum depression symptom severity.\textsuperscript{61,70,71} Maternal sleep patterns are enhanced by breastfeeding,\textsuperscript{13} while this deregulation may cause postpartum depression.\textsuperscript{61,70,71}

Research also shows that breastfeeding improves some psychological conditions and processes that can protect mothers from emerging postpartum depression. Maternal self-efficacy, a condition inversely associated with postpartum depression,\textsuperscript{72} is improved in mothers who breastfeed.\textsuperscript{45,73} Regardless of maternal depression, mothers who breastfed rather than bottle-fed their infants had higher confidence levels and rated their infants as less alert and less irritable during feedings.\textsuperscript{45} However, breastfeeding self-efficacy appears to play an important role on postpartum depression; mothers who show higher levels of breastfeeding self-efficacy present lower levels of postpartum depression symptoms.\textsuperscript{74}

Maternal emotional involvement with the infant is also improved by breastfeeding\textsuperscript{75} and is negatively correlated with postpartum depression.\textsuperscript{65,76} In fact, feeding patterns appear to influence mother-child bonding, with non-breastfeeding mothers presenting more difficulties to establish an emotional involvement with the infant than breastfeeding mothers.\textsuperscript{77} Regarding the relationship with the partner, studies relate breastfeeding initiation with stronger parental bonds.\textsuperscript{78}

Temperamental difficulties and sleep problems are reduced when the child is breastfed,\textsuperscript{79} while the presence of those problems has been associated with postpartum depression.\textsuperscript{72,80} Depressed breastfeeding mothers were less likely to have infants with highly reactive temperaments.\textsuperscript{45,79} Infant competencies are enhanced by breastfeeding,\textsuperscript{4,81} and are adversely affected in the presence of postpartum depression.\textsuperscript{80,82}

Breastfeeding also facilitates mother-infant interaction,\textsuperscript{45,83} which is poorer when the mother is depressed.\textsuperscript{78} Breastfeeding is associated with better mother-infant interactions, with breastfed infants showing more physical contact, vocalizations, and positive play, and mothers exhibiting more proximity towards the infant.\textsuperscript{56,79,83,84} Data also specifically suggests that depressed mothers and their infants, not unlike non-depressed mothers and their infants, may benefit from breastfeeding: depressed mothers and infants are more relaxed during breastfeeding versus bottle-feeding interactions.\textsuperscript{85} Furthermore, studies also showed that breastfeeding may act as a protector against maternal child maltreatment, especially child neglect.\textsuperscript{35} This association may depend on the protective effect of breastfeeding on maternal depression, as depression is the best predictor of child maltreatment and neglect. The impact of breastfeeding on the maternal attention sensitivity towards infant distress was also recently shown.\textsuperscript{86}

**Discussion**

Literature consistently shows that breastfeeding provides a wide amount of benefits for both the child and the mother. The psychological benefits for the mother are still in need of further research.

Despite the high rate of breastfeeding initiation, a large decrease in the number of mothers who breastfeed from the first few weeks postpartum is observed. Public health authorities’ efforts to promote breastfeeding initiation have been successful; however, the same has not been observed regarding its maintenance for a recommended period of time, which is for two years or more, and exclusively during the first six months.\textsuperscript{16–18} Identifying the possible underlying factors to this situation is a goal for research in this field. Maternal mental health may be one of the reasons behind this reality. A recent empirical study conducted in Portugal suggests that screening for depression symptoms during pregnancy can help identify women at risk for early cessation of exclusive breastfeeding.\textsuperscript{10} There is now empirical evidence that pregnancy depression is one of the factors that may contribute to breastfeeding failure.\textsuperscript{39,30,32,33,45,56}

Studies suggest an association between breastfeeding and postpartum depression, and the direction of this
association is still unclear. While some suggest a negative association between breastfeeding and postpartum depression,\textsuperscript{40-43} others point to a negative association between postpartum depression and breastfeeding.\textsuperscript{27,46,49,52-54}

Results from several studies provide empirical evidence that breastfeeding may act as a protective factor for depression during the postpartum, improving both maternal psychological well-being (namely through the regulation of sleep and awake patterns\textsuperscript{13,14} and increased self-efficacy\textsuperscript{65,73} and adequate parenting, through the enhancement of the emotional involvement with the infant,\textsuperscript{75,77} mother-infant interaction,\textsuperscript{45,81} attention sensitivity towards infant stress,\textsuperscript{86} and protection against child neglect.\textsuperscript{85} Breastfeeding can also protect women from depressive symptoms, by aiding the regulation of the HPA axis (through the regulation of diurnal basal cortisol secretion),\textsuperscript{88-12} which has been consistently shown to be deregulated in the presence of depressive symptoms.\textsuperscript{62,64,69}

Other relevant variables significantly related with both breastfeeding and postpartum depression that may play a part on this association are also highlighted in the literature: parity, related with breastfeeding\textsuperscript{11,63} and postpartum depression;\textsuperscript{35,70} quality of the relationship with the partner, related with breastfeeding\textsuperscript{75,87,88} and postpartum depression;\textsuperscript{89,90} and anti-depressant use, related with breastfeeding\textsuperscript{64,91} and postpartum depression.\textsuperscript{92} It is also important control for potential confounding variables such as parity, quality of the relationship with the partner, and medication use, and this has not always been accomplished. Moreover, few studies have defined breastfeeding according to standardized categories, few studies included a clinical diagnosis of postpartum depression, and few studies were prospective and completed adequate statistical analysis to capture a sequential relationship between depressive symptoms and breastfeeding initiation and duration. These may be some of the reasons for equivocal results in the literature.

Data, in a general way, demonstrate that breastfeeding failure is unequivocally associated with the presence of depression during pregnancy and postpartum. Some recent prospective studies clarify that depression during pregnancy is a risk factor for unsuccessful breastfeeding, and that breastfeeding is a protective factor for postpartum depression. Research is also starting to clarify which biological and psychological processes may explain this protection. However, there are still equivocal results in the literature that may be explained by the methodological limitations presented by some studies.

**Funding**

This work was supported by Portuguese fundings from the FCT/MCTES (PIDDAC) and by the European Community (FEDER COMPETE): Breastfeeding and Postpartum Depression (PTDC/SAU-SAP/116738/2010).

**Conflicts of interest**

The authors declare no conflicts of interest.

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